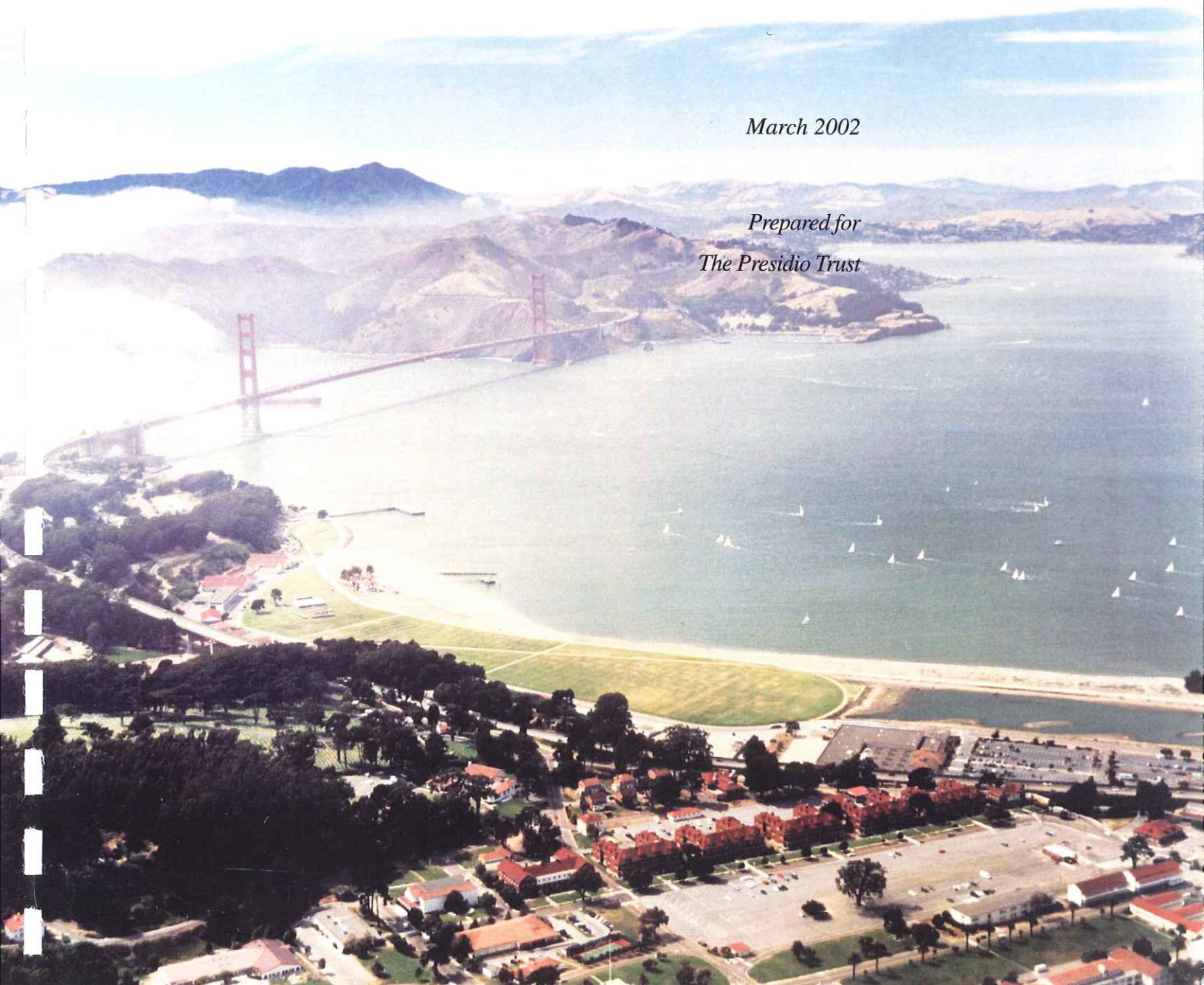
PRESIDIO WATER RECYCLING PROJECT

Environmental Assessment



March 2002

Prepared for

The Presidio Trust

As part of the Golden Gate National Recreation Area, the Presidio's significant natural, historic, scenic, cultural and recreational resources must be managed in a manner which is consistent with sound principles of land use planning and management, and which protects the Presidio from development and uses which would destroy the scenic beauty and historic and natural character of the area and cultural and recreational resources.

—From the Presidio Trust Act (P.L. 104-333).

The Presidio Trust is proposing the construction and operation of a water recycling system at the Presidio to provide high-quality recycled water for landscape irrigation and other non-potable uses, reducing potable water demand, and reducing the amount of sanitary sewer flows to the City and County of San Francisco's combined sewer system. The proposed treatment plant would be located within an existing building in the Letterman Complex. The Presidio Trust (the Trust) is the project proponent and the Lead Agency under the National Environmental Policy Act (NEPA).

This document is an Environmental Assessment (EA), and has been prepared in accordance with the requirements of NEPA, the Council on Environmental Quality's NEPA Regulations, and the Trust's Environmental Quality Regulations (36 CFR Part 1010). This EA is being circulated for public review and comment. Following completion of the public comment period and review of the comments received, the Trust will determine what actions are needed to complete the required NEPA review. If a Finding of No Significant Impact (FONSI) is determined to be the appropriate document, its availability will be publicly noticed in the Presidio POST newsletter and on the Trust's website. Please submit comments to the Trust by May 7, 2002 by mail, fax, or e-mail, to:

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GLOSSARY AND ACRONYMS

AF – acre feet
AFY – acre feet per year
Area A – coastal areas of the Presidio of San Francisco that are under the National Park Service's administrative jurisdiction
Area B – non-coastal areas of the Presidio of San Francisco that are under the Presidio Trust's administrative jurisdiction
BAAQMD – Bay Area Air Quality Management District
BCDC – San Francisco Bay Conservation and Development Commission
BMP/BMPs – Best Management Practice(s)
Cal OSHA – California Division of Occupational Safety and Health
CARB – California Air Resources Board
CCSF – City and County of San Francisco
CDFG – California Department of Fish and Game
CNDDB – California Natural Diversity Data Base
CNPS – California Native Plant Society
CSO – combined sewer overflow
CTMP – Construction Traffic Management Plan
cy – cubic yards
dB – logarithmic decibel scale
dBA – A-weighted frequency-dependent scale
DHS – California Department of Health Service
EA – Environmental Assessment
EIS – Environmental Impact Statement
ET – evapotranspiration
ft – foot (feet)
GIS – Geographic Information Systems
GMPA – Presidio General Management Plan Amendment *(adopted by the NPS in 1994)*
gpd – gallons per day
hp – horsepower
IDP – Industrial Discharge Permit
LDAC – Letterman Digital Arts Center
lf – linear feet
MG – million gallons
mg/L – milligrams per liter
MGD – million gallons per day
NAGPRA – Native American Graves Protection and Repatriation Act
NEPA – National Environmental Policy Act
NHL – National Historic Landmark District
NHPA – National Historic Preservation Act
NMFS – National Marine Fisheries Service
NPDES – National Pollutant Discharge Elimination System
NPS – National Park Service
OWPCP – Oceanside Water Pollution Control Plant
PTIP – Presidio Trust Implementation Plan *(in progress, the Trust's comprehensive planning update of the GMPA for Area B)*
RWF – recycled water facility
RWMP – *Recycled Water Master Plan*
RWQCB – Regional Water Quality Control Board
SAR – sodium adsorption ratio
SEWPCP – Southeast Water Pollution Control Plant
SIPs – State Implementation Plans
SJSC WWTP – San Jose/Santa Clara Wastewater Treatment Plant
SMBR – submerged membrane batch reactor
sqft – square feet
SWPPP – Storm Water Pollution Prevention Plan
SWRCB – State Water Resources Control Board
TDS – total dissolved solids
USFWS – U.S. Fish and Wildlife Service
UV – ultraviolet
VMP – Final Vegetation Management Plan

CHAPTER 1
INTRODUCTION AND PURPOSE & NEED

1.1 INTRODUCTION

The Presidio Trust is proposing to construct and operate a water recycling system at the Presidio of San Francisco. Use of recycled water for landscape irrigation has long been discussed as a positive step towards sustainability at the Presidio, and was originally identified in the 1994 *Presidio General Management Plan Amendment* (GMPA), prepared by the National Park Service (NPS). The GMPA and corresponding EIS assumed that up to 1 million gallons per day (MGD) of recycled water would be used at the Presidio for irrigation, with that recycled water provided by a plant constructed by the City and County of San Francisco (CCSF). Following establishment of the Presidio Trust by the U.S. Congress in 1996, the Trust wished to pursue the use of recycled water for irrigation purposes; however, it became clear that the City's planned water recycling plant would not be implemented for many years. During the environmental review of the Trust's Letterman Complex project, the City requested that the Trust consider developing an on-site water recycling system as a way to address concerns regarding cumulative impacts of wastewater generation and water demand. Specifically, the City expressed concern related to its Southeast Water Pollution Control Plant (SEWPCP) and combined sewer system overflows. In response, the Letterman Complex Final Environmental Impact Statement (EIS) included a measure requiring an on-site water recycling system to mitigate the cumulative effects of Presidio-wide projects. The measure specifically requires a plant capable of reclaiming and treating a minimum of 200,000 gallons per day (gpd) of sanitary sewage extracted from the Presidio Main sewer line (which flows to the SEWPCP). Implementation of the proposed water recycling project evaluated in this EA would fulfill this requirement, as well as the long-time vision for use of recycled water at the park.

1.2 PURPOSE & NEED

To adequately articulate the purpose and need of the proposed project, it is important to first understand the existing water and wastewater systems at the Presidio. Relevant background on these issues is provided below, followed by a description of the project's purpose and need, expressed in the form of project objectives.

1.2.1 BACKGROUND

WATER SUPPLY

The majority of the Presidio's water needs are met with on-site resources, specifically Lobos Creek. Water is diverted from the creek, treated at an on-site treatment facility, and conveyed through the local water distribution system. Lobos Creek flows vary from year to year, and have historically ranged from 1.2 to 2.1 MGD. In order to protect the natural resource values along Lobos Creek (one of the last free-flowing creeks in San Francisco), a minimum creek flow of 0.5 MGD is maintained. As a result, roughly 0.7 to 1.2 MGD of Lobos Creek water is available for diversion, treatment, and use at the Presidio (Presidio Trust 2001). Supplemental water is purchased from the San Francisco Public Utilities Commission (SFPUC) on an as-needed basis. The majority of these purchases occur during the warmer months when irrigation demands are higher and the availability of on-site supply is lower. The amount of water purchased from the SFPUC varies by year, and last year the Trust purchased roughly 15 percent of the total water used at the Presidio. The SFPUC gets its water primarily from Yosemite National Park (Hetch Hetchy Reservoir), with supplemental water provided by local watersheds. Like the Presidio, these local supplies vary from year to year, and have historically met from six to 18 percent of the SFPUC's demand (SFPUC 2001).

Current average daily water consumption at the Presidio is approximately 0.8 MGD. Of this total, almost half of the water is used for landscape irrigation. In the past and in the future, when more Presidio buildings are occupied, total water demands will be higher.

WASTEWATER SYSTEM

The Presidio has two separate sewer systems: one for sanitary sewage (wastewater) and one for stormwater. Stormwater is collected and conveyed to the Pacific Ocean, San Francisco Bay and Crissy Marsh.[1] Wastewater is collected and conveyed to the CCSF combined sewer system (which combines storm and wastewater). The CCSF and Trust meter the Presidio wastewater flows entering the CCSF system, and the Trust reimburses the City for the cost of treatment and disposal, which averages about $100,000 per month.

There are a total of five locations at the Presidio where wastewater is discharged to the CCSF's system. The majority of these flows (approximately 85 percent) are transported via the "Presidio Main," which is located at the park's northeastern corner near the Gorgas/Lyon Gate within the

[1] Stormwater flows within the Presidio are not the subject of the analysis contained herein. The Trust, in coordination with the NPS, is finalizing an interim Stormwater Pollution Prevention Plan (SPPP) that will include the sampling design and protocol, threshold requirements for constituents monitored, and a reporting mechanism. This is an interim plan that adheres to the general guidelines for storm water management as established under the National Pollutant Discharge Elimination System (NPDES), and will remain in effect until the Trust obtains an NPDES permit. Additionally, the plan will include Best Management Practices (BMPs), consistent with the California Stormwater Best Management Practices Handbook, including the use of oil-water separators (several are already in use at Crissy Field), street sweeping, and other actions to improve stormwater quality at the park.

Letterman Complex. At this time, current wastewater flows in the Gorgas/Lyon Gate area are roughly 250,000 to 300,000 gpd. These flows are conveyed to the City's Southeast Water Pollution Control Plant (SEWPCP) for treatment and disposal. Over time, as vacant buildings are occupied, it anticipated that these flows could increase to more than 500,000 gpd. For planning purposes, available wastewater flows are assumed to be roughly 500,000 gpd.

Historically, flows entering the CCSF system from the Presidio were much higher. Before leaving the Presidio, the Army implemented a large-scale infrastructure repair program. This program, as well as infrastructure repairs made by the Trust (i.e., slip-lining existing pipelines to minimize stormwater infiltration), have resulted in a substantial reduction in Presidio flows entering the CCSF combined sewer system. Although it is difficult to make a direct comparison between annual flow data from before and after these various improvements were made (as occupancy rates have also varied), there is clearly a noticeable reduction. For example, metering data indicates that total Presidio wastewater flows entering the CCSF system in 1990 were roughly 475 million gallons. In 2000, total annual flows were approximately 120 million gallons – or roughly one-quarter of the 1990 flows. By the year 2020, once vacant buildings are rehabilitated and reused, projected flows will increase but are never anticipated to reach 1990 levels. In fact, even without implementation of an on-site water recycling system, 2020 flows are still projected to be less than half of the 1990 flows.

As previously mentioned, the CCSF has identified concerns related to combined sewer overflows (CSOs) which occur during major storm events when partially-treated sanitary sewage from the SEWPCP is released to the Bay. During a CSO event, the SEWPCP can receive upwards of 300 million gallons of storm/wastewater. The CCSF asked the Trust to look specifically at three options to help off-set the Presidio's contribution to these flows, as well as long-term water supply issues: 1) consider an on-site water recycling system; 2) consider on-site storage of flows during wet weather events; and 3) consider redirecting flows from the SEWPCP to the Oceanside plant (which does not experience the same wet weather capacity problems). The two action alternatives evaluated in this EA were designed to be responsive to these requests.

Although the Presidio's contribution to CCSF wastewater flows is very small (less than one half of one percent of the dry- and wet-weather capacity of either the SEWPCP or Oceanside Plant), the SEWPCP has generated concerns because of the wet-weather overflows, and because of odors affecting the surrounding Bayview-Hunters Point neighborhoods. The Trust is committed to reducing the Presidio's contribution to these effects. Implementation of the proposed water recycling system, in combination with aggressive water conservation, are critical to achieving this reduction.

1.2.2 PROJECT OBJECTIVES

The purpose of the proposed project is to reduce potable water demand, and the amount of potable water consumed for non-potable uses (i.e., landscape irrigation) at the Presidio, and to provide a reliable and drought-proof source of recycled water for the Presidio that meets or exceeds Title 22 standards for Disinfected Tertiary Recycled Water. These are the principal

objectives of the project, which is also intended to reduce Presidio wastewater flows entering the CCSF's combined sewer system, and in particular reduce the Presidio's contribution to cumulative flows affecting the operation and proximity of the SEWPCP.

To be successful, the project must meet these objectives and must also avoid or minimize adverse environmental and cultural resource effects to the greatest extent practical, be financially feasible, and serve as a demonstration project for other land managers and interested members of the public.

CHAPTER 2
DESCRIPTION OF ALTERNATIVES

2.1 INTRODUCTION

Three alternatives for the proposed water recycling facility are evaluated in this EA: Alternative 1 (Centralized Storage), Alternative 2 (Multiple Storage Sites), and the No Action Alternative. Both action alternatives propose the rehabilitation and reuse of an existing building within the Letterman Complex for the proposed treatment plant. This Chapter provides background information on the development and refinement of the alternatives, as well as project conditions that have been identified by the Trust. A brief discussion of alternatives initially considered but removed from further evaluation in this EA is provided in Section 2.4. A regional location and map showing Presidio planning districts is presented in Figure 2-1.

2.2 DESCRIPTION OF ALTERNATIVES

2.2.1 BACKGROUND ON ALTERNATIVES DEVELOPMENT

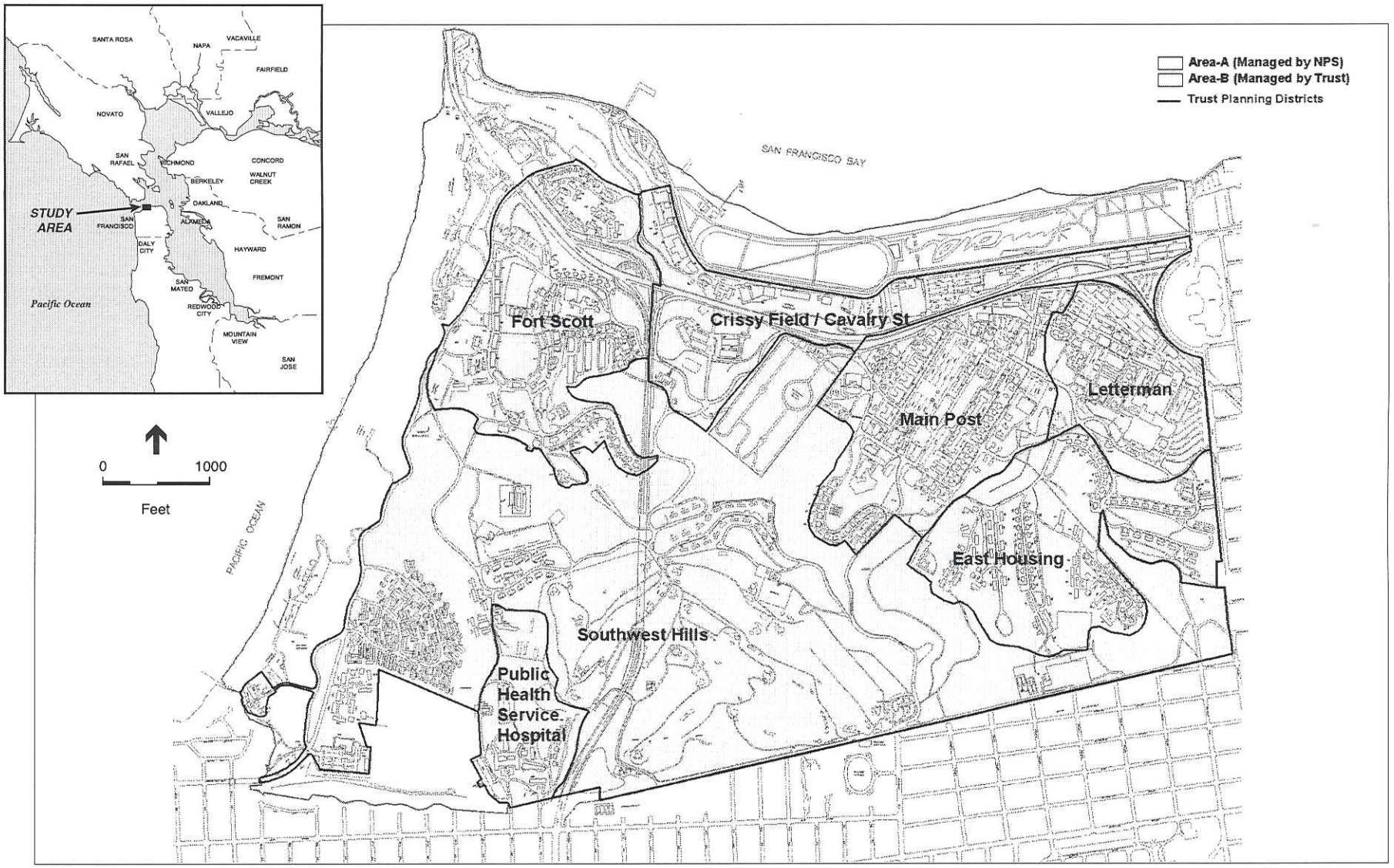
The Trust developed and refined the two action alternatives evaluated in this EA through the planning process and in response to scoping comments. A summary of the salient facts or other background that influenced the development of these alternatives is provided below.

- Approximately 85% of total wastewater flows at the Presidio are conveyed via the "Presidio Main" pipeline and discharged to the CCSF's combined sewer system near the Gorgas Gate within the Letterman Complex.

- Some water storage capacity is necessary to operate a recycled water system. Consistent with industry standards, proposed storage facilities are generally sized to accommodate the average daily demand during the summer period, providing operational flexibility and reliability, as well as supplementing treatment capacity during peak demand periods.

- Crissy Field (Area A) has already been equipped with the infrastructure necessary to receive recycled water (i.e., purple pipe). The Letterman Digital Arts Center (LDAC) is also being designed to accept recycled water.

- Treatment technologies were identified for their ability to meet the most stringent water quality requirements for a disinfected tertiary recycled water. The related requirements and byproducts are also considered, including facility/space needs, energy demands and potential odor generation.



SOURCE: Presidio Trust

Figure 2-1
Regional Location and Planning Districts

- In order to minimize environmental and historic effects of the project, pipelines and storage facilities were sited in areas that were previously disturbed or that have been identified for future environmental remediation activities. Preliminary pipeline alignments were revised based on field visits with various resource specialists to minimize potential impacts, as well as through the environmental analysis conducted during the preparation of this EA.

- In response to scoping comments, additional information on water conservation and its role in each of the alternatives was incorporated into the EA. Other modifications to the action alternatives in response to scoping comments include the provision of additional detail on the amount of projected recycled water use, size of facilities, and various operational aspects.

2.2.2 COMMON COMPONENTS OF ACTION ALTERNATIVES

Both action alternatives assume that the project would be implemented in phases, with Phase 1 representing a 0.2 MGD project and Phase 2 representing a 0.5 MGD project. Phasing is necessary based on the availability of raw wastewater flows, as currently vacant buildings become occupied in the future. It is assumed that Phase 1 would be implemented as soon as possible following completion of required NEPA and other compliance and permitting activities, while Phase 2 would be implemented in approximately seven to 10 years. Both alternatives could achieve the reductions in potable water use and in sanitary sewer discharges to the CCSF combined sewer system, as shown in Table 2-1.

The following components (discussed below) would be similar under both action alternatives:

- Water Conservation Practices;
- General Operations of the Proposed System;
- Recycled Water Users and Demands, and
- Basic Components of the Proposed System.

WATER CONSERVATION PRACTICES

The Trust will continue to identify and implement various water conservation measures, and these efforts would continue under all alternatives, including the No Action Alternative. Current measures include infrastructure repairs, installation and use of water-efficient fixtures, and public education. Water savings are already being realized through these practices, as reflected in the last several years of water use data. Specifically, average water use over the past three years has remained relatively constant at approximately 0.8 MGD, while building reuse/occupation has increased.

Conservation practices that are already being implemented by the Trust include the installation of low-flow fixtures, including aerators, low-flow showerheads, and low-flow toilets. These fixtures are installed in all rehabilitation projects throughout the park, and can improve water efficiency by as much as 50 percent. As additional buildings are rehabilitated, the Trust will continue to ensure that the water-efficient systems are installed. Other measures are currently being

TABLE 2-1
SUMMARY OF ANNUAL POTABLE WATER USE AND SANITARY SEWAGE DISCHARGES WITH AND WITHOUT THE PROPOSED PROJECT (IN MILLION GALLONS/YEAR)

	Existing	Existing Plus Project (Phase 1)	Future 2020 No Action	Future 2020 with Project (Phase 1 and 2)
Estimated Potable Water Use:				
Irrigation	133	98	184	100
Other Uses	152	152	264	264
Total	285	250	448	364
Projected Recycled Water Use	0	35	0	84
Estimated Total Sanitary Sewage Discharged to CCSF System	120	85	238	154

1 Estimated existing and future water use is based on currently available information and information provided in the PTIP Draft EIS (Presidio Trust 2001). Future water projections, and thus future sanitary sewage flows, do not factor in water savings that would be provided through implementation of conservation practices. Recycled water production amounts are based on estimated average annual demand, and would vary from year to year depending on annual precipitation, climate, etc.

implemented and/or will be implemented in the future, including the installation of water meters in Presidio buildings. Metering water enables billing to be based on consumption volume, which in turn promotes conservation.

Irrigation accounts for approximately half of the water usage on the Presidio. Efficient irrigation methods and scheduling are the key to reducing evapotranspiration (ET), seepage and surface runoff. In addition, the recently adopted Final Vegetation Management Plan (VMP) includes requirements for the use of drought-tolerant vegetation in all new landscapes. Although the Trust has made progress in increasing irrigation efficiency, this is an area where the Trust will be focusing future, new water conservation activities. The Presidio Golf Course irrigation system now operates on a satellite-based system that bases daily irrigation on ground moisture conditions, solar radiance, and precipitation. The Trust is in the process of replacing inefficient manual watering systems with new computer-controlled systems (timers) that will help increase future irrigation efficiencies, as well as other actions that will help further reduce water consumed for irrigation purposes.

GENERAL OPERATIONS OF THE PROPOSED SYSTEM

Raw wastewater would be diverted from a sanitary sewer main and conveyed to a treatment plant. Treatment would include biological treatment, filtration and disinfection, meeting the highest quality standards of California's Code of Regulations, Title 22 for Disinfected Tertiary Recycled Water. Following treatment, recycled water would be conveyed to a reservoir for storage, and subsequently delivered to the irrigation sites through a distribution system. This type of water is suitable for unrestricted body contact, and is commonly used throughout the state for landscape irrigation and a variety of other more restrictive uses (including irrigation of food crops).

The system would be designed to provide treatment capacity equal to the Maximum Month, Average Day irrigation demand. Peak demands would normally be met from a combination of treatment capacity and storage. The storage volume is planned to be sized equal to one day of Maximum Month, Average Day Demand. In addition, a standby connection to the potable water system would be provided at the storage reservoir to provide operational reliability (i.e., to meet prolonged periods of high demand or provide service when the treatment plant is off-line for maintenance).

The estimated average annual energy use would represent slightly less than two percent of the current average annual demand, which would be easily accommodated within the existing infrastructure and supply. Over time, energy demand would increase as the capacity of the plant increases and the distance (i.e., pumping needs) to irrigated areas increases. Even at the maximum capacity of the proposed water recycling system, average demands would represent just over three percent of current average demand. These demands would be partially offset by avoided pumping and treatment activities from the existing potable water treatment plant (which currently serves all irrigation demands at the park). In addition, irrigation with recycled water and the corresponding bulk of energy demands (i.e., pumping) would occur during the off-peak evening hours.

It is anticipated that the treatment and distribution system would typically require one full-time employee; however, start-up activities, some maintenance tasks and other seasonal demands would require full-time support from two operators.

Normal Operations

During the spring, summer and fall, the system would operate to meet varying seasonal irrigation demands. Raw wastewater would be diverted and treated primarily during the day, when the largest volumes of wastewater are available between the early morning and evening peaks. As the nighttime irrigation demand period begins, water would be pumped (or would flow by gravity, depending on the alternative) from storage to the user site. When demands exceed available storage and treatment capacity, supplemental potable supply would used.

Winter Operations

There are two basic operational scenarios that can be employed during the winter: the first, Continuous Operation, would maintain year-round plant operations and reduce wet weather

wastewater discharges to the CCSF system, while the second, Seasonal Operation, would shut down the plant during the low-demand winter months. Continuous Operation has been included in this EA at the request of the CCSF. Please refer to Sections 2.2.2 and 2.2.3 for additional information.

RECYCLED WATER USERS AND DEMANDS

Recycled water is proposed for irrigation use at several areas on the Presidio. Refer to Figure 2-2, which depicts the general use area boundaries and Table 2-2, which summarizes the projected recycled water demands.

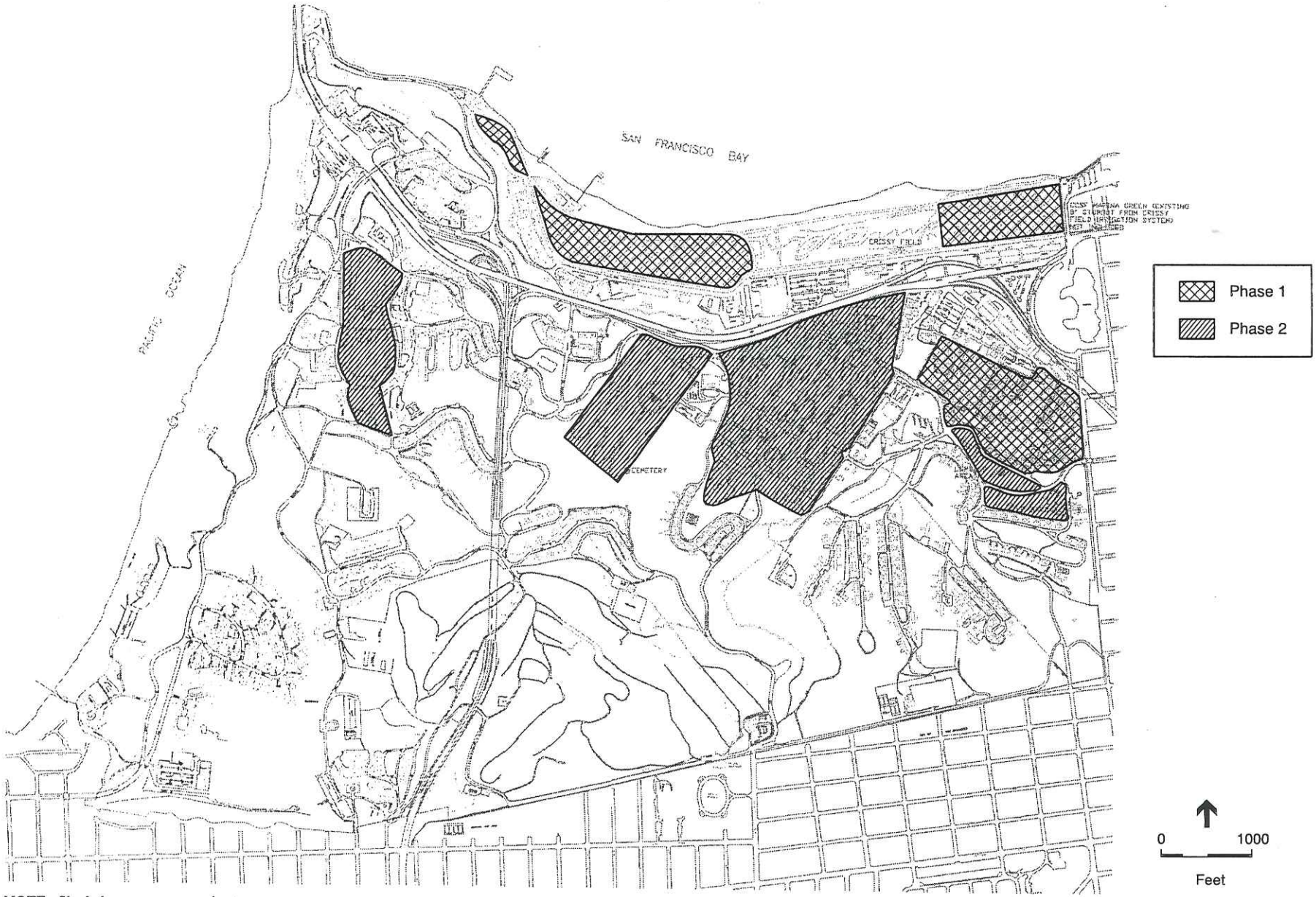
Phase 1 – 0.2 MGD

The initial customers would include the 23-acre LDAC and Crissy Field. The Crissy Field (Area A) irrigation system was previously designed and constructed with the intent of using recycled water, and is ready to accept service at this time. The LDAC is being designed for recycled water use. During periods of lower irrigation demand, the treatment plant may operate below its full design capacity; during times of peak irrigation demand, supplemental water from the Presidio potable water system would be necessary to meet demands.

Phase 2 – 0.5 MGD

The Trust would continue to monitor wastewater flows at the Presidio, and would consider implementation of Phase 2 as flows approach 0.5 MGD at the Gorgas Gate. Phase 2 customers would include all Phase 1 customers plus additional landscaped areas along the Lombard corridor, the Main Post area and potentially the National Cemetery and Fort Scott. The landscaped areas along Lombard Street as it enters the park (referred to in this document as the Lombard corridor) consist primarily of turf and trees between Letterman Drive and Lombard Street, and Sherman Road and Lombard Street. The Main Post area includes several discrete existing turf areas, and the demand projections include the possibility that the historic parade ground could be converted from the existing asphalt parking lot to turf. The National Cemetery site is a well-defined turf area. The Fort Scott area is primarily turf in landscaped areas and a ball field.

If desired by the CCSF, it is also possible that the Trust's plant would supply recycled water to Marina Green turf areas along Marina Boulevard may during Phase 2. Marina Green consists of three separate turf areas. This action would require the CCSF to conduct its own review and consideration of the project, and would require the Trust to eliminate some of the on-site use of recycled water so that the Marina Green demand could be met. There is an existing connection (purple pipe) located near Mason Street and Yacht Road that could potentially be used to provide service to Marina Green. Additional discussions with the NPS and CCSF would be needed to confirm the feasibility of this connection.



NOTE: Shaded areas are approximate.

SOURCE: Kennedy/Jenks Consultants

Presidio Water Recycling Project ■

Figure 2-2

Proposed Recycled Water Use Areas

TABLE 2-2
PROPOSED IRRIGATION AREAS AND
RECYCLED WATER DEMANDS BY PROJECT PHASE

Recycled Water Use Area by Phase	Average Annual Demand (AF/yr)	Average Monthly Demand (MGD)	Peak Month, Avg. Day Demand (MGD)	Peak Month, Peak Day Demand (MGD)
Phase 1- 0.2 MGD				
Crissy Field	81.7	0.097	0.155	0.233
Letterman Complex	23.3	0.021	0.052	0.060
Subtotal Phase 1	105.0	0.118	0.207	0.293
Phase 2- 0.5 MGD				
Lombard corridor	19.8	0.023	0.038	0.056
Main Post	46.7	0.055	0.089	0.133
National Cemetery	51.3	0.061	0.097	0.146
Fort Scott	34.1	0.040	0.065	0.097
CCSF/Marina Green	44.3	0.053	0.084	0.126
Total Phases 1 and 2[1]	256.9	0.297	0.496	0.725

[1] CCSF/Marina Green not included in total – future service to this area to be determined in future through consultation with the City as part of Phase 2.

SOURCE: Kennedy/Jenks Consultants 2002.

All Phase 2 users would require modifications to existing irrigation systems prior to receiving recycled water. Modification would include signage to meet the regulatory requirements of the California Department of Health Services, as well as ensuring that cross-connections to existing potable water supply are removed. In addition, all hose bibs must be removed from the irrigation system and other operational practices would be enforced as part of the water recycling permit requirements (see Section 3.3 for additional information on regulatory requirements).

BASIC COMPONENTS OF THE PROPOSED SYSTEM

Raw Wastewater Diversion

The raw wastewater source location would be in the vicinity of the Letterman Complex/Gorgas Gate area, where the Presidio's sanitary sewer discharges to the CCSF system. A diversion structure and pipeline would be installed underground, and equipped with a submersible pump station to convey the raw wastewater to the nearby treatment plant. Waste sludge and screenings from the treatment plant would be conveyed back to the CCSF sewer system for treatment and disposal (see below for additional information on proposed treatment process).

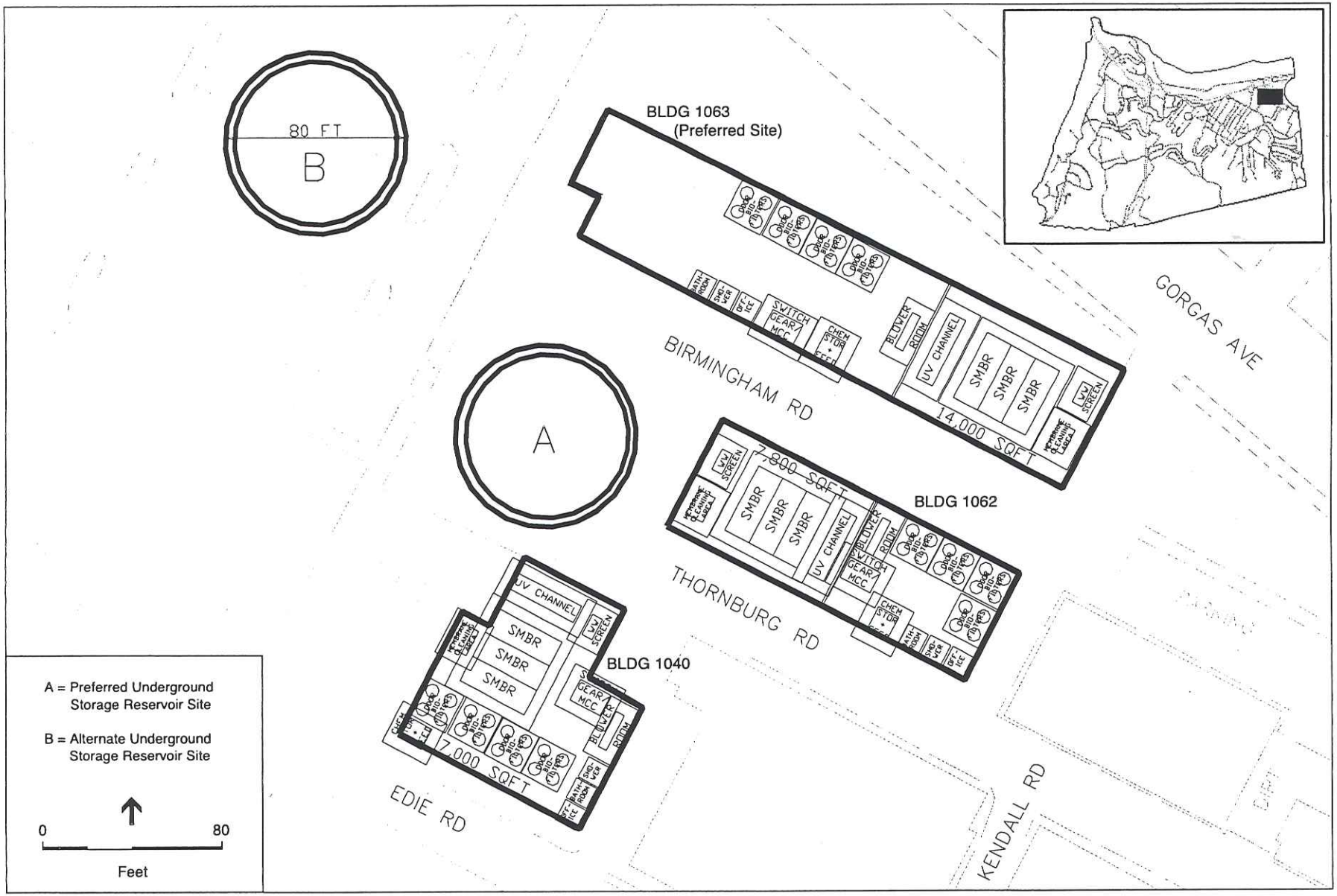
Recycled Water Treatment Facility

Consistent with Section 110 of the National Historic Preservation Act, the Trust is proposing to reuse and rehabilitate an existing historic structure to house the recycled water treatment plant, rather than construct a new facility. For both action alternatives, the same three buildings are being considered as alternate site locations: Buildings 1040 (former Powerhouse & Steam Plant), 1062 (former Quartermaster's shop) and 1063 (former Medical Supply Warehouse - and the Trust's preferred site). The buildings are in close proximity to the Gorgas Gate source of raw wastewater supply. The various treatment plant alternative sites are depicted in Figure 2-3, together with a conceptual layout of facilities within the buildings. Reuse of an existing structure would require seismic retrofit and other modifications to provide the necessary floor and overhead space for equipment, access for construction and operations and maintenance, and other modifications necessary to support equipment or rehabilitate architectural surfaces. The retrofit and layout would be refined through the design and engineering process, and would comply with the *Secretary of the Interior's Standards for the Rehabilitation of Historic Structures*. Although detailed cost estimates were not prepared for each alternative site, Building 1040 is likely to cost substantially more than the other two sites, based on the condition, size and layout of the building.

Raw wastewater would be diverted to the proposed plant for treatment, which would consist of fine screening, biological treatment/filtration, and disinfection. The product water would be pumped to a storage reservoir for distribution to end-users. The waste (solids/screening) from the system would be returned to the sewer, as is currently practiced.

The treatment process would consist primarily of a submerged membrane bio-reactor for biological treatment and filtration, and an ultraviolet (UV) light process for disinfection. Other ancillary systems include a fine screening, chemical storage and handling facilities, odor control facilities, air blowers with sound attenuation devices housed in a separate room, pumping systems, mechanical piping, electrical and control systems, fire sprinkling systems, and HVAC systems. Because the proposed system would function as a satellite treatment facility and no sludge/solids handling would occur, potential odor generation at the plant would be minimal. Odor control facilities within the plant building would further reduce the potential for any nuisance; in addition, provision would be made for future chemical addition (magnesium hydroxide) to suppress odor in the raw wastewater, but it is not anticipated that chemical addition will be necessary to control odor. Potential odor impacts are described in Section 3.8.

There is one chemical that would be necessary for routine use in the treatment building. Sodium hypochlorite (household liquid bleach) would be used as a cleaning solution for membrane maintenance, for odor control of screenings, and for residual disinfection of the recycled water. All chemical materials would be handled, stored and used in a manner consistent with applicable health and safety regulations. The degree of hazard associated with this chemical is described in Section 3.6.



NOTE: See table of contents for acronms.
NOTE: The location and orientaton of treatment facility components are conceptual.

SOURCE: Kennedy/Jenks Consultants

Presidio Water Recycling Project ■

Figure 2-3
Alternative Recycled Water Treatment and Underground Storage Sites

2.2.3 ALTERNATIVE 1 (CENTRALIZED STORAGE)

Alternative 1 is the Trust's preferred alternative. Under Alternative 1, all storage needs would be met by the construction and operation of a new 500,000-gallon subsurface reservoir. The project components associated with Alternative 1 are presented in Figure 2-4.

RECYCLED WATER STORAGE

During Phase 1, a 500,000-gallon subsurface storage reservoir (tank) located in the vicinity of the treatment plant would be constructed. This facility would provide adequate storage for Phases 1 and 2 of the project, and no supplemental storage facilities would be needed.

The new 500,000-gallon subsurface storage reservoir would be approximately 80 feet in diameter by 20 feet overall structure depth, and would be buried below turf or paved/parking areas. Two sites (A and B) have been identified as potential locations for this facility (see Figure 2-3). Both sites are currently covered by asphalt (one within an existing parking lot), and both have been identified for environmental remediation (i.e., excavation) of petroleum hydrocarbon contamination. It is assumed that construction of the storage reservoir would be concurrent with site remediation activities in order to minimize total ground disturbance and construction activities at the park.

A pump station would be needed at either subsurface storage reservoir to provide the delivery pressure and flow to meet the necessary service conditions. The pump station would be submersible, and would be housed within the proposed subsurface storage reservoir. The pumping units would be designed for serving different customer requirements to conserve energy and provide good demand/supply matching (i.e. low lift for Crissy Field, medium lift for Letterman and high lift for the National Cemetery and Ft. Scott). A motor control center and electrical service would be located in the selected treatment building. Access to both facilities would be provided for regular maintenance.

Reservoir Option A

This site would require pavement/foundation and utility demolition and relocation of existing electrical, sanitary, storm drain and potable water lines. Several of these utilities appear to be abandoned. This site has the highest priority for site remediation work and is closest to all building options, and is the Trust's preferred location. The reservoir roof would be designed so that it is buried below earth fill and sodded, or used for another use, including parking or as a roadway.

Reservoir Option B

This site would require the temporary removal of parking pavement and removal of an apparently abandoned sanitary sewer. Treatment of the reservoir surface would be similar to that described for Reservoir Option A.

RECYCLED WATER DISTRIBUTION SYSTEM

The recycled water distribution system would include underground pipelines ranging in size from 4 to 12 inches in diameter. Refer to Figure 2-4, which presents the proposed distribution system pipeline alignments by phase as well as linear feet and other relevant information. As shown in Figure 2-4, the proposed pipeline alignments would be located within existing roadways and/or paved areas. The California Department of Health Services (DHS) has established Sanitary Separation Requirement for recycled water pipelines that also set minimum clearances for horizontal separation between recycled water and potable water or sanitary sewer pipelines. This requirement is generally 10 feet horizontal; however, it can be as little as four feet if additional pipe design requirements are met.

WINTER OPERATIONS

Under Alternative 1, there would be two basic operational scenarios that could be employed during the winter: continuous plant operation or seasonal closure. Continuous operations are included to be responsive to requests made by CCSF. Further coordination with CCSF would be needed to ensure an effective operational regime is achieved during continuous winter operations and that related logistical issues are addressed.

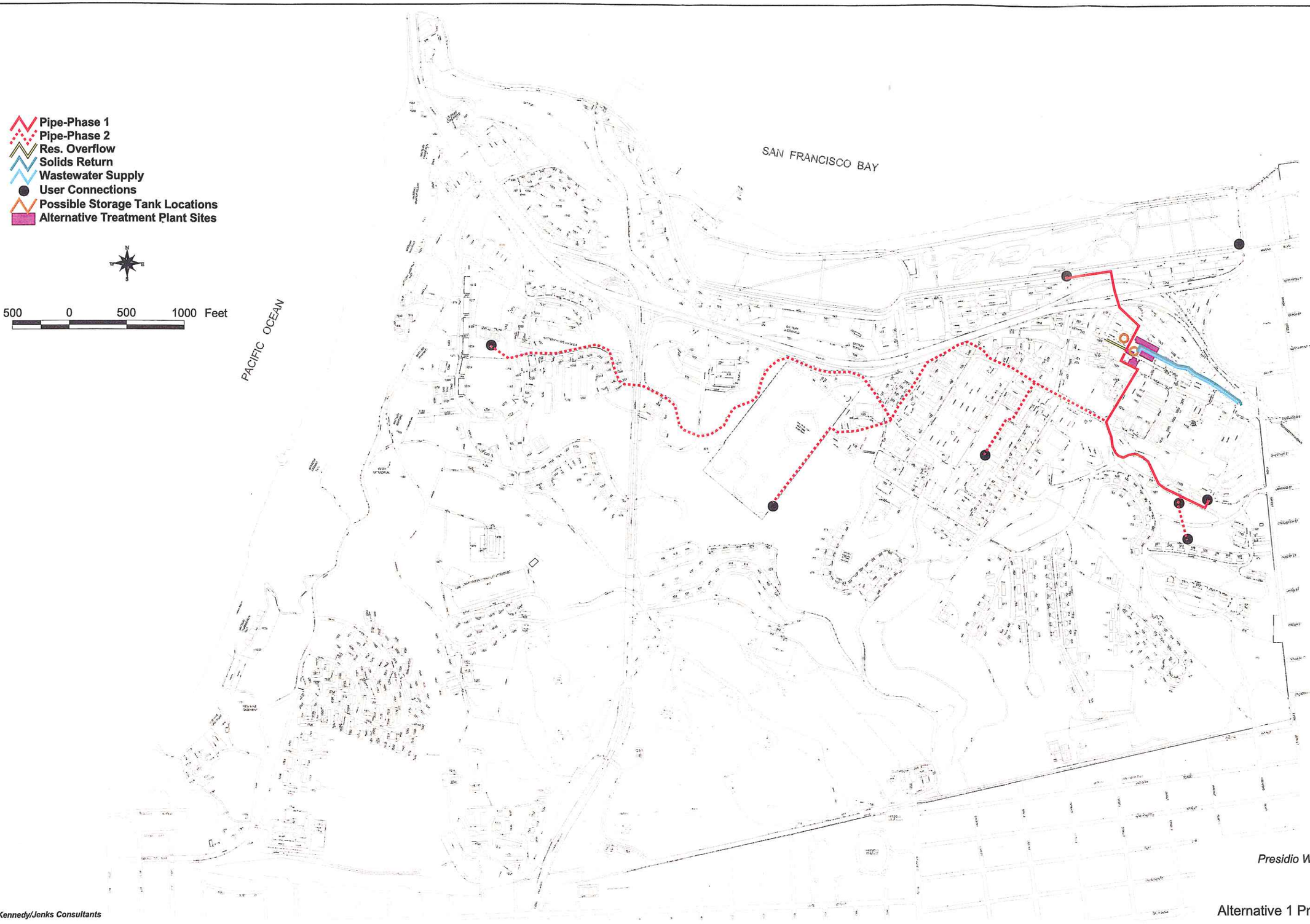
Continuous Treatment Plant Operation

At times during the winter, irrigation demands would be minimal and the treatment plant would operate at the minimum rate possible to maintain the health and viability of the biological treatment process. If inadequate irrigation demand exists, small amounts of treated (not disinfected) water would be sent back to the sanitary sewer. Additional time would be needed by operators during the winter to manage the treatment process under this scheme, as compared to the seasonal operation as described below; costs would also increase for this operational scenario.

The recycled water storage reservoir could be maintained at low levels during the winter, so when wet weather occurs, the treatment system could be manually operated to fill the reservoir with treated water, reducing wet weather discharges by up to 500,000 gallons. When the reservoir fills, the treatment system stops. Following the storm event, the treated water could be used for irrigation or discharged to the sanitary sewer system during off-peak periods.

Seasonal Treatment Plant Operation

Another possible operating scenario is to decommission the treatment plant during late-November each year for the winter season, and use the standby potable water connection to fill the storage reservoir to meet the very low winter irrigation demands. This operating scenario does not provide any wet-weather discharge reduction, but would likely reduce operations effort and cost, and provide time for scheduled maintenance of facilities. The plant could be brought back into operation over a two-week period in March for seasonal use.



Presidio Water Recycling Project

Figure 2-4

Alternative 1 Project Components

SOURCE: Kennedy/Jenks Consultants

CONSTRUCTION METHODS AND SCHEDULE

It is estimated that it would require 12 months to construct each phase. Phase 1 is proposed for implementation starting in fall 2002, with completion in fall 2003. Implementation of Phase 2 would occur sometime in the future, and would be dependent upon the reuse/occupation of buildings at the Presidio and subsequent availability of raw wastewater. At this time it is anticipated that Phase 2 would be implemented in seven to 10 years from the implementation of Phase 1, or between 2010 and 2013.

Pipeline construction would be traditional "cut and cover" construction within a trench. Pipeline trench width would be vary between 24 and 30 inches. Pipeline depth is anticipated to range from three feet minimum to six feet from grade where a utility crossing exists. At crossings with multiple existing utilities, the pipeline may need to be deeper to maintain one foot of vertical clearance between pipelines. There would typically be active work areas of about five feet on one side of the trench and 10 to 12 feet on the other side for access by trucks and loaders, resulting in a construction easement approximately 20 feet wide, unless otherwise restricted for environmental protection (see Section 3.6). Excavated trench materials would be reused for trench backfill or taken to an approved landfill for disposal. Following construction, the pipeline corridor would be rehabilitated to match the pre-construction conditions (i.e., roadway resurfacing, approved vegetation treatment or replacement of trail tread material). Work would proceed at a rate of approximately 200 feet per day. Construction equipment used for pipeline construction would include pavement saws, jack hammers, backhoes, front-end loaders, dump trucks, flat-bed delivery trucks, cranes, compactors, concrete trucks, and paving equipment. There would be an estimated 10 workers for pipeline construction.

The existing building used for the proposed treatment plant would need to undergo a seismic upgrade, which would be required regardless of whether the project is implemented. Seismic upgrade would likely consist of reinforcing diaphragm connections and use of sheer walls, and would need to be coordinated with the planning of construction of the treatment facilities.

During construction of the treatment facilities, concrete for the building foundations and pads would be delivered to the site by ready-mix trucks; a crane would be used to set equipment; and supply trucks would be used to deliver materials and equipment used in the treatment process. All construction phases would involve the use of pickup trucks and worker vehicles. There would be approximately ten workers at the treatment plant site during the entire construction phase. Adjacent paved areas (i.e., parking lots) would serve as staging areas.

Construction of the underground storage reservoir would occur concurrently with the treatment plant construction. As stated previously, petroleum hydrocarbon remediation efforts are planned for the area that would consist of soil excavation and disposal. Once the removal of hazardous materials is completed, reservoir construction would begin that would likely include additional soil excavation, installation of a foundation, placement of concrete forms and then concrete. Dewatering of the construction site would be necessary during construction.

2.2.4 ALTERNATIVE 2 (MULTIPLE STORAGE SITES)

This alternative also proposes the construction and operation of a water recycling system, similar to that described for Alternative 1. The Phase 2 pipeline alignments, storage facilities, and potential wet weather operations distinguish this alternative from Alternative 1 (Centralized Storage). The project components associated with Alternative 2 are presented in Figure 2-5.

RECYCLED WATER STORAGE

During Phase 1, recycled water would be stored in a 400,000-gallon subsurface storage facility located in the vicinity of the treatment plant. Storage sites A and B described above would be applicable to this alternative. As part of Phase 2, supplemental storage would be provided through the rehabilitation and reuse of an existing (abandoned) 100,000-gallon reservoir in the western side of the park (near Washington Blvd and Highway 1). Refer to Figure 2-5.

Existing Abandoned Reservoir

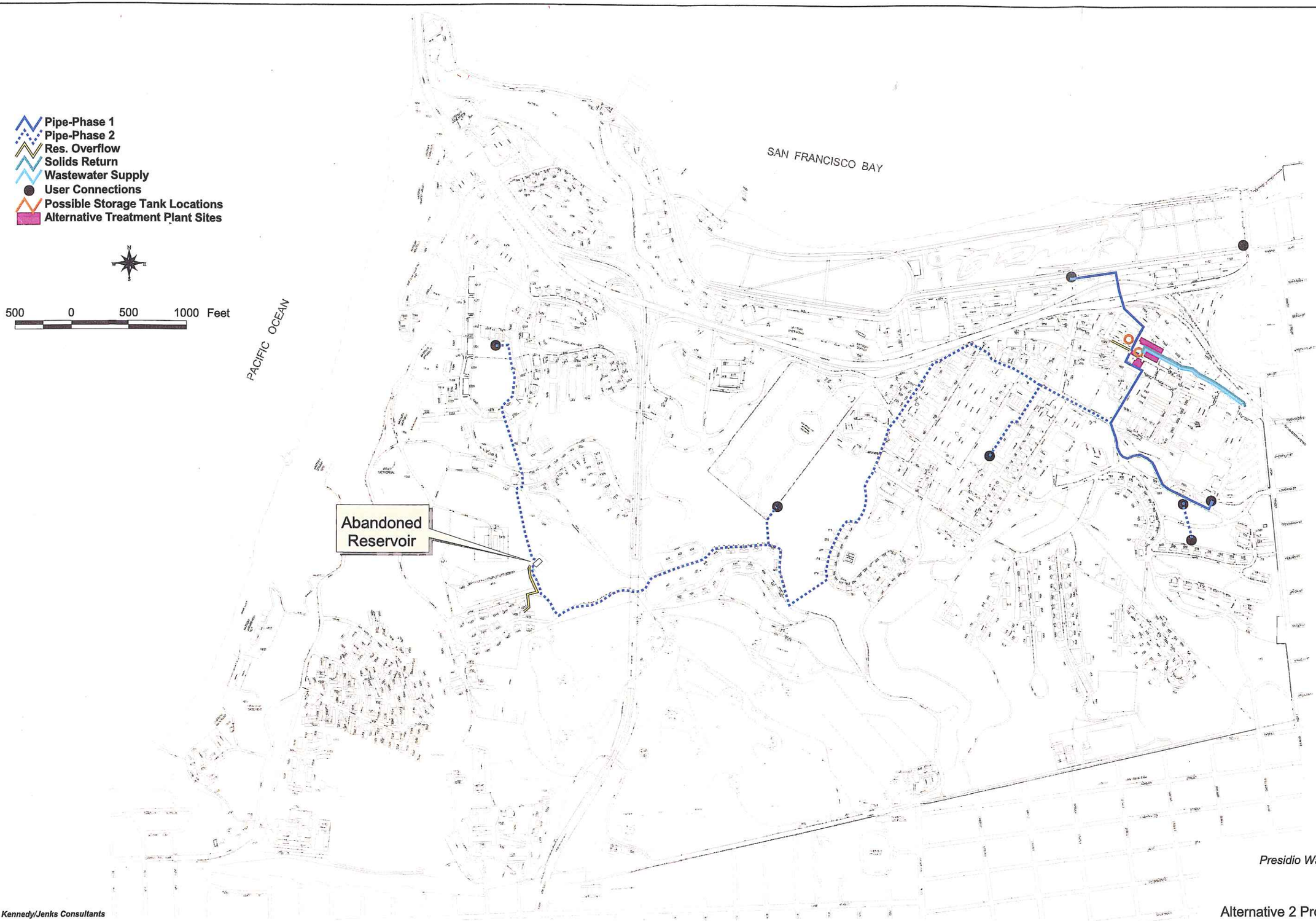
The existing abandoned 100,000-gallon reservoir was constructed in 1897 by the Army as part of its potable water supply system. Reuse of this reservoir would require rehabilitation, as well as site restoration and piping modifications. Based on field investigations, it is anticipated that the site (i.e., area within the existing fenceline surrounding the reservoir) would require clearing of overgrown vegetation and new fencing. The abandoned reservoir would likely require roof repairs, painting, bug screen, seismic retrofit, telephone/electric service, level controls, and possibly a liner or coating system to provide a water-tight structure. A new standby potable water connection would need to be provided, as well as a gravity overflow pipeline to provide safe routing to an existing sewer.

RECYCLED WATER DISTRIBUTION SYSTEM

The proposed pipeline distribution system for Alternative 2 is presented in Figure 2-5. Information related to the relative size, depth and DHS requirements for pipeline construction described under Alternative 1 would apply to Alternative 2 as well.

WINTER OPERATIONS

As described for Alternative 1, there would be two basic operational scenarios that can be employed during the winter: continuous operation and seasonal closure. Each of these operational scenarios is described below, with an emphasis on the differences between the two alternatives.



Presidio Water Recycling Project

Figure 2-5

Alternative 2 Project Components

SOURCE: Kennedy/Jenks Consultants

Continuous Treatment Plant Operation

Under this scenario, operations would be generally as described for Alternative 1. However, under Alternative 2, Phase 2, the reuse of the abandoned 100,000-gallon reservoir has the potential to provide a third scenario for wet weather operations (beyond the two scenarios already described for Alternative 1). This third scenario would allow continuous discharge of recycled water to the City's Oceanside Plant, which the City previously requested the Trust to consider (refer to Section 2.1 for background information). Reuse of the existing reservoir would require that a gravity overflow pipeline providing safe routing to an existing sewer be established. During peak wet-weather conditions, the treatment plant could be continuously operated, recycled water could be pumped to the reservoir, and subsequently diverted via the overflow pipeline into the sanitary sewer that ultimately flows to CCSF's Oceanside Plant. Detailed hydraulic analyses and coordination and evaluation with the CCSF would be needed prior to implementation. This operational scenario would require the most operational effort and the highest cost of all treatment scenarios.

Seasonal Treatment Plant Operation

Seasonal treatment plant operation would be the same as described for Alternative 1.

CONSTRUCTION METHODS AND SCHEDULE

Construction methods and schedule described under Alternative 1 would be the same for Alternative 2, with the exception of a substitution of additional work involved in piping and rehabilitation of the reservoir, per the above description.

2.2.4 SUMMARY OF ACTION ALTERNATIVES AND CAPITAL COSTS

Table 2-3 provides a summary comparison of the two action alternatives described above, together with the estimated capital costs for both alternatives and phases. For additional background on the alternatives, please refer to the Presidio Water Recycling Project Plan, which is on file at the Presidio Trust Library (34 Graham Street, Presidio of San Francisco). Copies will also be made available upon request (see cover page of this EA for contact information).

TABLE 2-3
ALTERNATIVES SUMMARY COMPARISON

Component	Alternative 1: Centralized Storage	Alternative 2: Multiple Storage Sites
Raw W/W diversion / Sludge return pipeline	Gorgas Gate	Same
Treatment Plant Location	Bldgs 1040, 1062, or 1063	Same
• Phase 1 capacity, MGD	0.2	Same
• Phase 2 capacity, MGD	0.5	Same
Treated Water Storage	0.5 MG underground storage (2 alternative sites)	0.4 MG underground storage (2 alternative sites), plus rehab existing 0.1 MG reservoir
• Winter Operation: continuous operation option	Up to 0.5 MG wet-weather storage per event	Up to 0.4 MG wet-weather storage per event in Phase 1, up to 0.5 MG or possibly continuous diversion to CCSF Oceanside system in Phase 2[1]
• Winter Operation: seasonal closure option	No wet-weather flow reduction	No wet-weather flow reduction
Recycled Water User Areas		
• Phase 1	Crissy Field, Letterman	Same end users, different piping/distribution system
• Phase 2	Areas A & B, Main Post, National Cemetery, Fort Scott, and/or Marina Green	Same end users, different piping/distribution system
Capital cost (Phase 1/Phase 2) (millions of dollars)	$5.35 / $2.93	$5.22 / $3.35
Total capital cost (millions of dollars)	$8.28	$8.57

[1] Additional evaluation and consultation with the CCSF would be required prior to implementation of continuous diversion option

2.2.5 NO ACTION ALTERNATIVE

Under the "No Action" alternative, the proposed recycled water project would not be implemented and all irrigation demands at the Presidio would continue to be met with potable water. Based on metering data from the last several years, average water consumption at the Presidio has remained at roughly 0.8 MGD. Of this total, about 54 percent can be attributed to domestic consumption and 46 percent goes for irrigation uses. Over time, as the buildings in the Presidio are rehabilitated and occupied, water demands are projected to increase. Under all of the

alternatives in this EA, the Trust would continue to develop and implement water conservation practices. In particular, irrigation efficiency at the park would noticeably increase over time; however, there would always be a demand for irrigation water at the park. Under the No Action Alternative, this demand would be met exclusively by potable water. In addition, wastewater flows would continue to increase at the park as buildings are rehabilitated and occupied. Although water conservation measures and various infrastructure repairs would help minimize the volume of wastewater, all flows from the park would be conveyed to the CCSF's combined sewer system.

2.3 BEST MANAGEMENT PRACTICES

The Trust has identified a series of best management practices (BMPs) that would be implemented as part of either action alternative. Additional project-specific mitigation measures that were developed through the environmental analyses are presented in Chapter 3. All of these conditions have been incorporated into the two action alternatives. In addition, various regulatory requirements would also apply to the two action alternatives. A description of these requirements is provided in relevant sections of Chapter 3.

BMP-1: EROSION/RUNOFF CONTROL

The Trust would require construction contractors to implement a Stormwater Pollution Prevention Plan (SWPPP), which includes Best Management Practices (BMPs) to minimize potential water quality impacts, control erosion and sedimentation, and prevent the inadvertent introduction of non-native invasive plant species during construction. The Trust would require contractors to implement the SWPPP and BMPs for construction activities similar to those included in the California Storm Water Best Management Practices Handbook (Stormwater Quality Task Force, 1993) and/or the Manual of Standards for Erosion and Sediment Control Measures (ABAG, 1995). The BMPs would include measures guiding the management and operation of construction sites to control and minimize the potential contribution of pollutants to storm runoff, disturbance of wetland features (via runoff or sedimentation), and prevent the inadvertent introduction of non-native invasive plant species into construction areas. Measures would include procedures for controlling erosion and sedimentation and managing all aspects of the construction process to ensure control of potential water pollution sources and restrictions on the removal and disposal of non-native plant species.

Erosion and sedimentation control practices typically include:

- Developing a long-term and short-term approved erosion control strategy;
- Limiting construction to the dry-weather months, to the greatest extent practical;
- Installing silt fencing, weed-free rice straw mulch or bales, check dams, geofabrics, drainage swales, sand bag dikes and/or straw wattle wherever deemed appropriate for runoff and erosion control (only rice straw would be permitted to prevent inadvertant introduction of wheat and barley species); and

- Soil stabilization, to include compacting to natural state, and grading to natural topography to the greatest extent feasible.

BMP-2: DUST CONTROL

Consistent with the Bay Area Air Quality Management District's recommendations, the Trust would require construction contractors to implement a dust abatement program during construction, which should include, at a minimum, the following elements:

- Water all active construction areas (where soil is exposed) at least twice daily, depending on type of operation and wind exposure;
- Designate a person or persons to oversee the implementation of a comprehensive dust control program and to increase watering, as necessary;
- Construction grading and trenching activities should be discontinued in high wind conditions where excessive dust problems occur, as determined by the construction inspector;
- Cover all trucks hauling soil, sand, and other loose materials, or require all trucks to maintain at least two feet of freeboard (i.e., the minimum required space between the top of the load and the top of the trailer) in accordance with Section 23114 of the California Vehicle Code during transit to and from the site;
- Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent streets.

BMP-3: NOISE CONTROL

To reduce noise due to construction, the Trust would require that construction contractors muffle or control noise from construction equipment through implementation of the following measures:

- Equipment and trucks used for construction would be required to utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds, wherever feasible). Construction vehicles would be properly maintained and equipped with exhaust mufflers that meet relevant standards;
- Impact tools (e.g., jack hammers and pavement breakers) used for construction would be hydraulically or electrically powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. Where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust would be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves would be used where feasible, and this could achieve a reduction of 5 dBA. Quieter procedures would be used such as drilling rather than impact equipment whenever feasible;
- Noise-generating construction activities would be avoided during times of the day in which such construction activities are prohibited under the San Francisco Noise Ordinance;

- Stationary noise sources would be designed with acoustical treatments (building enclosures, louvered vents, noise walls, etc.) that are adequate to maintain potential noise generation to levels at or below ambient levels, and/or sources would be located as far from sensitive receptors as possible muffled so that the noise is reduced to an acceptable levels.

BMP-4: BIOLOGICAL RESOURCE PROTECTION

To minimize the potential for impacts on biological resources, the Trust would implement the following actions – along with those previously described for erosion, dust and noise control:

- Construction activities would be located at least 100 feet from the edge of existing native plant communities and/or assemblages. If this is not feasible, the following measures would be used:

  - Temporary protective fencing or other barriers would be installed, in consultation with Trust natural resource staff, around affected native plant communities and natural habitat to avoid inadvertent disturbance by construction crews;

  - Consistent with the adopted *Presidio Vegetation Management Plan* (VMP) measures NP-2, 3 and 6, a revegetation plan would be prepared and implemented for any area where native plant communities would be disturbed. The plan would include performance standards, species selection, a monitoring plan, and maintenance program. The plan would be prepared prior to soil disturbance activities to ensure that propagules and plant material would be available. If this is not feasible, soil stabilization and invasive non-native plant inhibition measures would be employed until future revegetation occurred. Approved erosion control measures would be installed and either weed inhibition fabric or dense rice straw mulch would be applied to the area until the revegetation plan was completed and implemented (see below). Weed inhibition measures would be developed on a site-specific basis (i.e., considering constraints within each VMP management zone) and could include the application of weed protection fabric and 4 to 6 inches of mulch; and

  - Daily inspections by Trust natural resource protection staff would be completed in the affected areas during construction.

- Non-native plant control would be done to ensure no new non-native invasive plant species are introduced to the park and to prevent the spread of existing non-native plants. Control measures would be defined in accordance with the Trust natural resource staff, and would include, but are not limited to:

  - Conduct weeding program in areas where revegetation occurs for a minimum of three years to ensure plant establishment. Post-construction qualitative monitoring would be conducted to identify locations where targeted non-native species have established;

  - Preserving stratigraphy of soils (to include supported vegetation and seedbank that would be used as top-dressing post construction) removed during construction of distribution line in areas deemed appropriate by either natural resource specialist or forester;

  - Cleaning equipment during construction activities whenever equipment works within patches of invasive non-native species (that could be transported by equipment) prior to beginning construction in other non-impacted areas; and

  - Disposal of non-native plants removed during pipeline construction would be done in accordance with Trust guidelines.

- The Trust Forester would be consulted prior to construction activities in any forested area to ensure that appropriate tree protection measures are implemented. These measures would include identifying areas where protective fencing would be installed prior to construction to prevent impacts to trees or root systems directly adjacent to the project area, as well as examining the proposed route in the field. During construction, the Trust Forester would be notified if roots greater than two inches in diameter are encountered or severed;

- Consistent with VMP mitigation measures WI-1 through 4 (Appendix E, pg. 22), construction activities would be phased or otherwise modified to avoid or minimize impacts on nesting birds;

- No incompatible fill materials would be introduced into natural or historic forest areas; only fill material that is compatible with future restoration/rehabilitation would be approved in coordination with a natural resource specialist or geologist; and

- Plant operations would be done in a manner consistent with the Trust's Integrated Pest Management practices to ensure that pests are not attracted to the site.

BMP-5: TRAFFIC AND TRANSPORTATION

A Construction Traffic Management Plan (CTMP) would be prepared by the construction contractor to show specific methods for maintaining traffic flows on roadways directly affected by project construction. The CTMP will include, at a minimum, the following elements:

- Construction equipment and vehicle routes would be documented and would comply with City restrictions on neighborhood streets surrounding the Presidio.

- Hours of operation for trucks and/or employee traffic would be established, as would the quantity and location of construction parking during various phases of construction.

- The contractor would install appropriate barriers or fencing around construction zones, and put up signage showing safe detours to ensure the safety of vehicles, pedestrians, and bicyclists.

- Where feasible, alternate one-way traffic flow past the pipeline construction zone would be maintained. Intermittent traffic control plans would be developed prior to closing any roadways, and advance warning signs for major closures will be provided and coordinated with park police.

- The contractor would be required to maintain access to driveways and side streets with alternate routes or steel plates across open trenches, as appropriate.

- Access for emergency vehicles would be provided at all times.

- Construction trenches in streets would not be left open after work hours.
- The contractor would proactively work with the Trust and area transit providers (MUNI, GGT and the Presidio Shuttle) to ensure adequate access for transit vehicles, and minimize disruption of transit services.

The CTMP must be reviewed and approved by the Trust prior to issuance of permits, and would be implemented by the contractor during construction. The CTMP would be a requirement of the project, and information about this requirement would be made available to construction contractors during the Request for Proposals process. The selected construction contractor(s) would complete the CTMP at least 60 days prior to commencing work.

BMP-6: HAZARDOUS MATERIALS

To minimize the potential for hazardous materials to impact soil, surface waters, or groundwater quality, the Trust would implement the following actions:

- Follow manufacturer's recommendations on use, storage and disposal of chemical products used in construction;
- Avoid overtopping construction equipment fuel gas tanks;
- During routine maintenance of construction equipment, properly contain and remove grease and oils; and
- Properly dispose of discarded containers of fuels and other chemicals.

2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

A brief discussion of the alternatives that were considered but eliminated from detailed study is provided below, including an explanation for their removal.

2.4.1 LARGER PROJECT

During early planning, the Trust considered a larger project involving partnership with the CCSF. At that time, this option was considered based on the apparent excess demand for recycled water and the potential to treat wastewater from both City and Presidio sources. Since that time, however, additional information on potential recycled water use areas/demands (see below) led to removal of this alternative from further evaluation in this EA. If, in the future, conditions change that make this alternative feasible, the Trust and City could consider this opportunity and conduct necessary environmental review.

2.4.2 MULTIPLE, SMALL TREATMENT PLANTS

The construction of a series of 'package' treatment plants throughout the Presidio was initially considered as possible project alternative. Based on the lack of available wastewater flows at

multiple locations throughout the park, this was determined to be infeasible. (Refer to Section 2.2 for additional background on the availability of raw wastewater and location of recycled water demands.)

2.4.3 ALTERNATIVE RECYCLE WATER USE AREAS AND USES

RECYCLED WATER USE AREAS

There are other areas within the Presidio where potable water is currently used for landscape irrigation, which were initially considered as potential recycled water use areas but were removed for the reasons described below. These areas include the Presidio Golf Course, various residential areas, and several ballfields/recreation sites.

Lobos Creek is the primary potable drinking water source for the Presidio, and the Trust's Domestic Water Supply Permit specifically prohibits the use of recycled water within the Lobos Creek watershed. The **Presidio Golf Course** is located within the Lobos Creek watershed, and was therefore removed as a possible future recycled water use area.

The **Wherry and Washington Housing** areas have several small landscaped areas that are currently irrigated; however, these areas are located within the Lobos Creek Watershed and were therefore removed from consideration as part of this project, as described above for the golf course. In addition, all of Wherry and potentially some of the Washington housing would be removed over time to accommodate natural resource restoration activities.

Several residential areas and ballfields in the **East Housing** planning district are located within the Tennessee Hollow restoration study area. It is anticipated that the need for irrigation water and associated infrastructure in this area could be substantially reduced or possibly eliminated, depending upon the outcome of the restoration planning that was initiated late last year. Because future demand for irrigation in this area is unknown, and current demands are relatively small, these possible recycled water use areas were removed from consideration as part of the proposed project. Following removal of the above areas, the park-wide projected demand for recycled water was reduced such that the proposed 0.5 MGD project would successfully meet the bulk of on-site recycled water demand.

DISCHARGE OF RECYCLED WATER

The concept of discharging recycled water into Crissy Field or Tennessee Hollow was initially considered as a way to increase water available for restoration projects, as well as to reduce the amount of wet weather flows entering in the CCSF's combined sewer system during peak wet weather events. The availability of other measures to effectively achieve the same end (i.e., reduce wet weather flows to the CCSF system), and the opposition expressed by the National Park Service during scoping led to its removal from further evaluation at this time.

TOILET FLUSHING

The use of recycled water for toilet flushing was initially considered. While there are many uses for recycled water, the primary focus for this project is on irrigation, as irrigation represents a substantial portion of the potable water budget for the Presidio, and as such provides the greatest potable water savings opportunities. Additionally, many of the structures at the Presidio are historic, including those that are contributing features to the National Historic Landmark district. Implementation of dual plumbing within these structures could require major renovation that would likely disturb the historic fabric.

Removal of the above potential recycled water use areas or uses from this EA does not preclude consideration of these activities in the future, should conditions or circumstances change which alter the basis for their removal.

CHAPTER 3
ENVIRONMENTAL ANALYSIS

3.1 INTRODUCTION

This chapter of the EA provides an assessment of the potential environmental consequences associated with the project alternatives and the No Action alternative. A separate section is provided for each environmental element. For each environmental element, a discussion of the "Affected Environment" is first presented, which summarizes the relevant regulatory and other background information to establish the context in which the proposed alternatives may be evaluated. This is followed by an evaluation of the "Environmental Consequences" that provides a scientific and analytical basis for the comparison of the proposed alternatives. This analysis includes both direct and indirect environmental effects. Effects are evaluated in terms of context, intensity, and duration.

For environmental consequences that would potentially be significant, mitigation would be required that would reduce the effect to a less-than significant level. For environmental consequences that would not be considered significant, mitigation measures may still be recommended in order to further reduce the potential adverse effect. Many standard measures would be included with either of the proposed action alternatives, as described in Section 2.3.

In order to satisfy the purpose of 40 CFR 1508.9 (a) (1) to determine whether there may be significant impacts, the scope of the EA is focused on issues for which there is a potential for significant effects. This scope was determined based on input received during the scoping period and through initial review and analysis by the Trust. A summary of scoping comments is provided in Chapter 4. The level of analysis is proportional to the relative significance of each environmental issue.

The proposed facilities associated with Alternatives 1 and 2 would either be located within an existing building or underground. No impact on existing views or visual resources would occur and this topic is not evaluated further. (An analysis of the rehabilitation and reuse of existing buildings on historic fabric is provided in Section 3.5, Cultural and Historic Resources). Neither of the action alternatives would alter or otherwise impact recreation or visitor use at the park. The proposed type of recycled water would meet or exceed the highest level of Title 22 standards for recycled water and permitted uses include unrestricted body contact, irrigation of food crops, and irrigation of school playgrounds and public parks. No changes in the type of visitor or recreational use in areas irrigated with the recycled water would occur, and no further analysis of this subject is contained in this EA.

Executive Order 11988 requires that all federal agencies conduct an analysis of their proposed action on floodplains. Pursuant to this Order, floodplains are defined by FEMA as the 100-year floodplain. The Presidio of San Francisco is located entirely outside of the designated 100-year floodplain, and therefore this topic is not addressed further. Executive Order 12898 requires that all federal agencies evaluate the impact of proposed actions on minority and low income populations. This Order is specifically designed to prevent disproportionate environmental impact of federal actions on these groups. The proposed project would not have an adverse impact on surrounding populations, and these populations are not considered minority or low-income. In addition, the reduction in off-site wastewater flows that would occur as a result the proposed project would have an indirect beneficial effect on the neighborhoods surrounding the City's Southeast Water Pollution Control Plant (SEWPCP). As described in Chapter 1 (Introduction and Purpose & Need), the reduction in wastewater flows to the City's SEWPCP is one of the primary objectives of the project. The Presidio's flows represent less than one half of one percent of the dry and wet weather capacity of the SEWPCP. Therefore, although in the context of total flows the project represents a small improvement, the effect would be beneficial. No further analysis of this beneficial effect is warranted.

3.2 LAND USE & POLICY CONSISTENCY

3.2.1 AFFECTED ENVIRONMENT

EXISTING LAND USES

All of the alternative treatment plant sites are located within the Letterman Complex planning district. Although the proposed distribution pipelines extend beyond this area, the pipelines would be underground and would not change or otherwise impact land uses. (The temporary construction effects of all project components are analyzed in the Air Quality, Noise and other relevant sections in this Chapter.)

The planning districts surrounding the Letterman Complex include Crissy Field to the north, which is an important recreational, cultural and natural area with coastal access, an 18-acre restored salt water marsh and dune community, historic airfield and related visitor-serving uses. To the west is the Main Post, which is considered the heart of the Presidio, containing a mix of commercial/office, residential and recreational uses such as the visitor center for the park, the Officer's Club, bowling alley, post office, theater, bank, and various offices. East Housing is located south of the Letterman Complex and is dominated by residential uses with two recreational ballfields. To the east and outside of the Presidio is the Exploratorium and Palace of Fine Arts (a remnant structure from the Panama Pacific International Exposition) and the Marina and Cow Hollow neighborhoods of San Francisco, which include a variety of higher density residential, commercial and various neighborhood-serving uses (restaurants, dry cleaners, shops, theaters, banks, etc.).

The 60-acre Letterman Complex is located along the eastern portion of the Presidio. It serves as a main entrance to the park and is considered one of the most urban districts within the Presidio (Final GMPA, 1994 pg. 72 and Draft PTIP, 2001 pg. 100). The district has had a long history of intensive land uses and development that has left a strong physical imprint on the land. Its close proximity to Doyle Drive/Highway 101 and the City also contribute to its urban setting. There are roughly 50 buildings within the Complex - about 2/3 of which are currently occupied. Existing land uses include office, residential, public safety, recreation and commercial. Historically, the dominant building features were the former Army Hospital and Research Institute. These two buildings were the largest two structures at the Presidio, and are currently being replaced with the Letterman Digital Arts Center (LDAC) – a 23-acre mixed-use campus focused on research, development and production of digital arts and related technologies. Once complete, the campus will include a series of new buildings surrounding a seven-acre public park (Great Lawn) which will replace an existing parking lot. Directly west of the 23-acre campus is the Thoreau Center for Sustainability, which is comprised of roughly 60 different tenants, primarily not-for-profit organizations focused on environmental and social issues that occupy a collection of 12 buildings along Torney, O'Reilly and General Kennedy Avenues. To the north are a variety of recreational facilities including a tennis court, a gym and pool (all affiliated with the YMCA), and a series of warehouses and other industrial-type buildings that historically supported the hospital complex. The majority of these buildings are vacant, with some office and

storage uses. The Swords to Plowshares, a non-profit organization committed to serving the needs of Veterans, occupies two buildings that are used for residential and training purposes. The Trust and National Park Service also use a building for temporary, dormitory-type residential use. The U.S. Park Police maintain a nearby building for storage/office use.

The three alternative treatment plant sites are clustered within an area of warehouse/industrial type buildings, along Thornburg and Birmingham Roads in the northeastern area of the Letterman Complex. The three buildings are mostly unoccupied, with two buildings (1062 and 1063) being used for storage. The two proposed subsurface storage sites are located in the areas immediately surrounding the treatment plant sites and are currently used as a parking lot and open paved area (see Figure 3.2-1).

PLANNED LAND USES

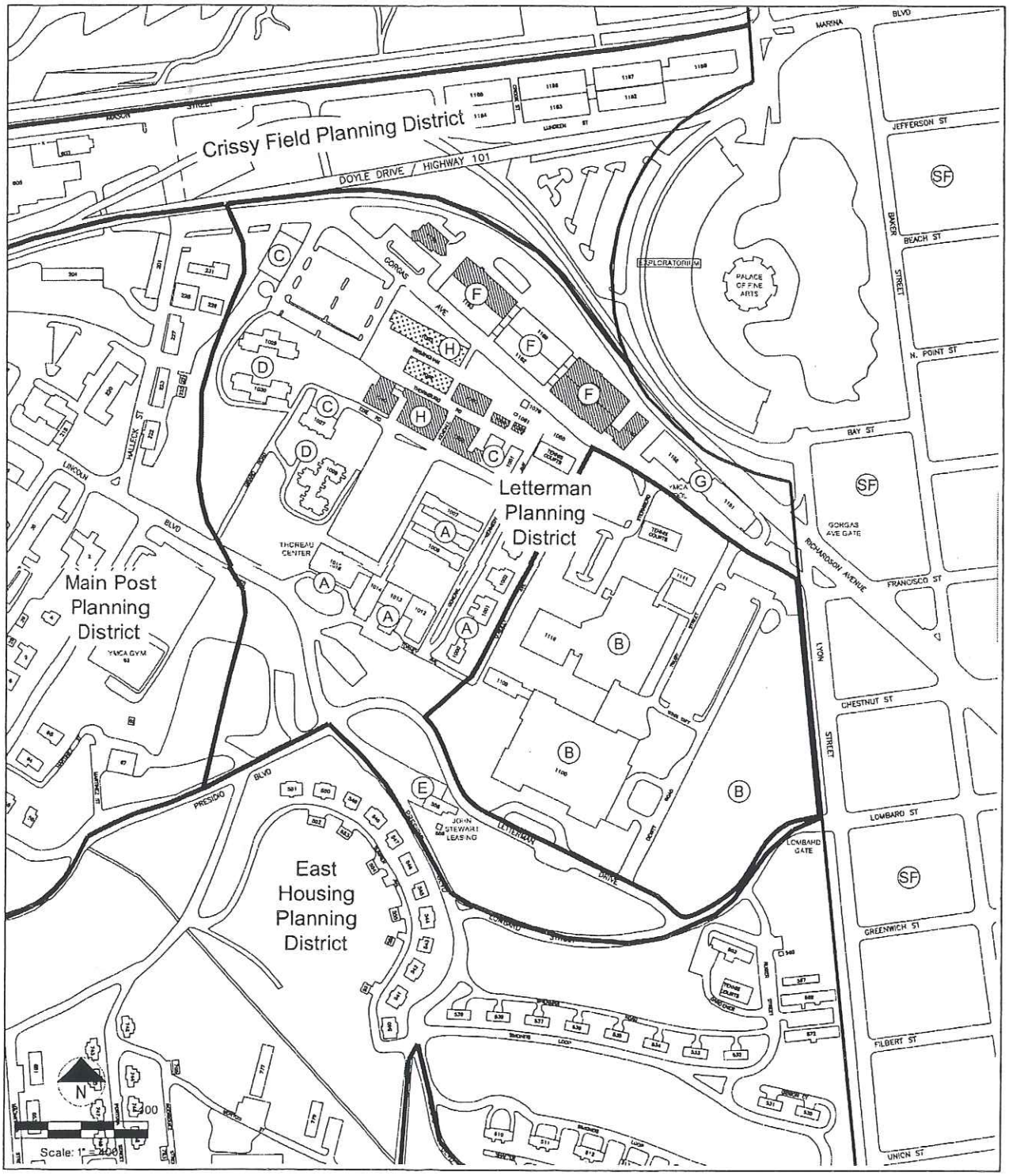
Planned land uses at the Presidio are currently described in two comprehensive land use plans – one adopted and one proposed. The *Presidio General Management Plan Amendment* (GMPA) was approved by the National Park Service in 1994, updated for the Letterman Complex by the Trust in 2000 (via the Letterman Complex Final EIS and Planning and Design Guidelines), and is currently the adopted land use plan for the Presidio. As described in Chapter 1, the Presidio Trust is in the process of updating the GMPA for Area B through the proposed *Presidio Trust Implementation Plan* (PTIP). Once NEPA review is completed and a preferred alternative is adopted by the Trust, the PTIP will serve as the long-term land use plan for Area B. Therefore, a discussion of both the GMPA and Draft PTIP are presented below.

GMPA

The Final GMPA land use vision for the Letterman Complex is for a scientific research and education complex to be used to "...nurture ideas and support research and actions to improve human and environmental health." The concept presented in the Final GMPA identifies a variety of land uses within the Letterman Complex that generally maintain the basic pattern of existing development, with some conversion of developed areas (i.e., paved areas and non-historic buildings) to open/green space. All three alternative treatment plant buildings were identified for rehabilitation and reuse for science education and research on the assumption that UCSF would seek to locate a second campus at the Presidio. As described above, the concept for the Letterman Complex was updated in 2000.

Draft PTIP

The Draft PTIP envisions the Letterman Complex as a "...compact, mixed-use office and residential area with support services, some visitor amenities, and access to transit." As described above, the LDAC will be one of the principal land uses within Letterman, as will the existing Thoreau Center for Sustainability. Other office and support uses would be located



Legend

- Presidio boundary
- Planning district boundaries
- Letterman 23-acre site
- Currently vacant
- Used for storage only (unoccupied)
- (A) Thoreau Center for Sustainability
- (B) LDAC (under construction)
- (C) Trust & NPS offices/other uses
- (D) Dormitories (Swords to Plowshares, NPS, Trust)
- (E) Presidio info/residential leasing office
- (F) Warehouses
- (G) YMCA gym and pool
- (H) Historic hospital support bldgs. (laundery, power plant, warehouses)
- (SF) San Francisco neighborhoods

SOURCE: Presidio Trust

Presidio Water Recycling Project ■

Figure 3.2-1
Existing Land Uses

within rehabilitated buildings or on in-fill sites, with some housing to foster a jobs-housing balance. Consistent with the GMPA and the *Letterman Planning and Design Guidelines* (Trust 2000), the former central courtyard (currently a parking lot) would be re-established, historic patterns of spatial organization would be maintained and reinforced, and a pedestrian-friendly, urban campus-like setting would be created. Restoration of Tennessee Hollow creek and riparian corridor would define the western boundary of the district. Historic patterns of spatial organization and primary view corridors would be maintained and enhanced, including the important Golden Gate views provided along the Thornburg corridor.

RELEVANT POLICIES

The Final GMPA and Draft PTIP are very similar in their policy statements related to water resource management. Both identify sustainability as a cornerstone in the reuse and conversion of the base into a national park, and identify the use of recycled water as an important step in meeting this goal. These two plans, along with the *Letterman Planning & Design Guidelines* (Presidio Trust 2000) provide the basis for the policy consistency analysis. Information from the *San Francisco General Plan*, while not binding on federal lands, is also presented.

GMPA

"Objective: Promote and demonstrate conservation practices, including energy conservation, water conservation, and waste reduction and recycling. Use reclaimed water wherever possible." (GMPA, pg. 52)

The text supporting this objective also acknowledges that "One key to conserving potable water will be the use of reclaimed water from the Presidio and the City of San Francisco for irrigation and other nonpotable water requirements. Because of the large amount of green space at the Presidio...use of recycled water could be significant." It goes on to state that "Utility systems will be retrofitted where possible to permit reclaimed water use." (GMPA, pg. 53)

Draft PTIP

"Planning Principle 23: Conservation and Reclamation – Implement and demonstrate conservation practices, including energy conservation, water conservation, stormwater management, and waste reduction and recycling. Use reclaimed water whenever possible." (Draft PTIP, pg. 55)

The text supporting this principle reiterates the GMPA's commitment to using recycled water as described above, and identifies steps to ensure that recycled water is available for use at the park. In particular, the Draft PTIP acknowledges this project, and the efforts that have been taken by the NPS and Trust to retrofit existing systems to be compatible with the use of recycled water. The Draft PTIP also indicates that along with the proposed water recycling plant there would be "...educational and interpretive information, to establish the Presidio as a site where visitors can learn about water resources and water recycling within the infrastructure of a sustainable community." (Draft PTIP, pg. 56)

City and County of San Francisco General Plan

The Presidio is under exclusive federal jurisdiction; therefore it is not directly subject to state and local land use plans, policies, or regulations. However, the Trust seeks to be a good neighbor, minimize possible conflicts between Trust activities and City policies, and consults with the City to achieve consistency wherever possible. The *San Francisco General Plan* (City and County of San Francisco, n.d.) contains general land use policies and objectives for San Francisco. Lacking any jurisdiction, the City has not developed any site-specific plans for the Presidio property; however, relevant water management policies were reviewed. Objective 6, Policy 2 encourages and promotes research on the necessity and feasibility of water reclamation.

More recently, the City has taken several actions to reinforce and strongly encourage the use of recycled water. In 1991, the City passed *Ordinances 390-91* and *391-91* which outlined the components to be included in a *Recycled Water Master Plan* (RWMP) for the City. In July 1996, the City prepared the RWMP, which described a three-phased program to provide up to 10.3 MGD of recycled water for non-potable use within the City. Although the EIR for the RWMP was certified, the City has not adopted the RWMP (it is currently being revised by the City). The City's endorsement of the use of recycled water is reflected its an active participation in the Bay Area Regional Water Recycling Program and in the *Final Urban Water Management Plan for the City and County of San Francisco Public Utilities Commission* (February 2001) and in adoption of Article 22 (Section 1204) of the San Francisco Public Works Code, which requires installation of dual piping in newly constructed buildings within certain areas of the City thought to offer the greatest potential for the use of reclaimed water.

3.2.2 ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE 1 (CENTRALIZED STORAGE)

Effects on Existing and Planned Land Uses

Under Alternative 1, one of the three building alternative sites would be rehabilitated and reused as a water recycling plant. As described in Section 3.9, Noise, operational noise associated with the plant would be attenuated and would not be perceptible at nearby residential and office uses. Further from the plant, operational noise would continue to attenuate and would be negligible, falling within the existing ambient noise environment. Because the proposed plant would not involve solids handling and would process relatively weak wastewater, the potential for odor effects would be minimal (as compared to a conventional wastewater treatment plant). The proposed water recycling plant would be designed with dual odor control facilities that would effectively contain odors within the treatment building, and would not pose a nuisance to adjacent or nearby uses. Refer to Section 3.8, Air Quality and Odors, for an analysis of odor impacts.

Two possible subsurface storage sites are being considered as part of Alternative 1. Both sites are located within close proximity to the three alternative treatment plant sites, and both have been designated for future environmental remediation. Under Alternative 1, the storage facility would

be constructed immediately following remediation activities. Following construction, the storage facility would be completely contained underground, and its surface would be designed to accommodate other uses.

Implementation of Alternative 1 would be considered consistent with the planned land uses set forth in both the GMPA and the Draft PTIP. Under the GMPA, buildings within the Letterman Complex are to be rehabilitated and reused for scientific research and education purposes, with a focus on actions to improve human and environmental health. The adaptive reuse of any of the three alternative building sites for a water recycling facility would be consistent with the overall land use vision for this area. This Alternative would demonstrate the beneficial reuse of water, one of California's most scarce resources, promote improved water conservation and a reduced dependency on local and regional water resources, and would be consistent with the GMPA vision for this area. Under the Draft PTIP, the Letterman Complex would become a compact, mixed office and residential use area that would include support services while maintaining historic patterns of spatial organization. The proposed water recycling system would function as a support service for the Letterman Complex, as well as other areas within the park. Reuse of existing buildings and the provision of subsurface storage would help ensure that the historic patterns of spatial organization and important view corridors are maintained. The minimization of noise and odors from the facility would reduce the potential for nuisances, and no conflicts among planned land uses would occur.

Alternative 1 would not create a substantial land use conflict or compromise the nature or character of the Presidio or its surroundings, and no mitigation is recommended or required.

Consistency with Relevant Policies

As previously described, use of recycled water and other water conservation actions are common themes of the management policies established in both the GMPA and Draft PTIP. As a national park with a substantial built environment (i.e., historic buildings), many urban-type demands for services are needed. These needs have been recognized by the NPS and Trust, and are reflected in specific policies related to the use of recycled water as well as the overarching goals describing sustainability, reducing the reliance on outside resources, maximizing conservation and efficiency, and becoming more self-sustaining. Implementation of an on-site water recycling system is an important step towards achieving this broad vision. By implementing Alternative 1, the Trust would not only reduce potable water consumption for irrigation or other non-potable uses, but it would also reduce the amount of wastewater conveyed off-site for treatment. Alternative 1 is consistent with the policies set forth in both the GMPA and Draft PTIP.

Alternative 1 is consistent with, and would carry out in part, the sustainability and water management direction set forth in the GMPA and the Draft PTIP. No mitigation is necessary.

ALTERNATIVE 2 (MULTIPLE STORAGE SITES)

Effects on Existing and Planned Land Uses

Similar to Alternative 1, Alternative 2 would include the construction and operation of a water recycling plant at one of the three alternative sites. Underground storage would also be provided, albeit a somewhat smaller facility, at one of the two alternative storage sites within the Letterman Complex. (Refer to above analysis for a detailed discussion of potential land use conflicts related to these project components.) During Phase 2, supplemental storage would be provided through the rehabilitation and retrofit of an existing abandoned reservoir in the western portion of the park, within the South Hills planning district. The reservoir is located in a forested area surrounded by a chain-link fence, with residential uses occurring roughly 1,000 and 500 feet to the north and south, respectively. A recreational trail is located along the edge of the reservoir. Storage would be for treated water only, and no odor or other potential nuisances or conflicts with surrounding land uses would occur as a result of the proposed reuse of the existing reservoir.

> *Alternative 2 would not create a substantial land use conflict or compromise the nature or character of the Presidio or its surroundings, and no mitigation is recommended or required.*

Consistency with Relevant Policies

Alternative 2 would similarly achieve the basic project objectives, and in so doing would be considered consistent with relevant GMPA and Draft PTIP policies, as described above for Alternative 1.

> *Alternative 2 is consistent with, and would carry out in part, the sustainability and water management direction set forth in the GMPA and the Draft PTIP. No mitigation is necessary.*

NO ACTION ALTERNATIVE

Effects on Existing or Planned Land Uses

The No Action Alternative would not impact existing or planned land uses, and no substantial conflict would be created.

Consistency with Relevant Policies

Under the No Action Alternative, no steps would be taken to implement the policies set forth in both the GMPA and Draft PTIP. The GMPA and corresponding EIS specifically identified the use of up to 1.0 MGD of recycled water for landscape irrigation at the Presidio. The Draft PTIP similarly identifies use of recycled water as an important action toward achieving sustainability at the park, and emphasizes the use recycled water whenever possible. Under the No Action Alternative, recycled water would not be available for use at the Presidio. Although the Trust would continue to implement domestic and irrigation water conservation measures, potable water would continue to be used for irrigation and other non-potable uses. This Alternative would be inconsistent with the fundamental water management policy statements from the GMPA and Draft PTIP.

Selection of the No Action Alternative would be inconsistent with relevant policies established in the GMPA and Draft PTIP. No feasible mitigation is available to remedy the inconsistency, other than implementation of one of the action alternatives.

3.3 WATER RESOURCES

3.3.1 AFFECTED ENVIRONMENT

PRIMARY WATER BODIES

The major surface water bodies within the Presidio are Lobos Creek, Crissy Marsh, Mountain Lake, Tennessee Hollow, El Polin Spring (and associated tributaries located between Rodriquez and Sanchez Streets), and Dragonfly Creek. The locations of these water features are presented in Figure 3.3-1; additional detail is presented in Section 3.4, Biological Resources. Although these water features have undergone alteration from their natural state based on past human uses, they existed at the Presidio prior to European settlement and development. Mountain Lake, for instance, is smaller than it was before the western portion was filled for the construction of Highway 1.

Lobos Creek, the primary potable water source at the park, is just over one mile in length and is the only remaining naturally occurring surface water drainage in the Presidio. Originating near the southern boundary of the Presidio and discharging to the Pacific Ocean, Lobos Creek is recharged by groundwater released from springs and seeps. Crissy Marsh is an 18-acre tidal salt marsh that was restored as part of the larger 100-acre Crissy Field Restoration Project. Mountain Lake, is a natural, unlined lake occupying approximately four acres and likely fed by groundwater, with some contribution from surface water runoff. The area around El Polin Spring, also referred to as Tennessee Hollow, contains three tributaries and is currently being studied for restoration opportunities.

WATER QUALITY

Water quality at the Presidio has been affected by historical activities, such as the creation of landfills, installation of underground storage tanks, and use of herbicides, fungicides and insecticides while the U.S. Army managed the Presidio (please refer Section 3.6, Hazardous Materials, for additional detail). Other uses of the park contribute to water quality degradation, such as nonpoint-source runoff from roads and parking lots that contains organic chemicals and heavy metals, and ongoing use of fertilizers and herbicides. The Trust is in the process of preparing an interim Storm Water Pollution Prevention Plan (SWPPP) for the Presidio. The SWPPP will adhere to the general guidelines for storm water management as established under the National Pollutant Discharge Elimination System (NPDES), and will remain in effect until the Trust receives its Phase II NPDES permit. The SWPPP will include a sampling and reporting program for storm water quality, as well as Best Management Practices (BMPs) consistent with the California Stormwater Best Management Practices Handbook. BMPs include the installation of oil/water separators on discharge lines where appropriate, four of which have been installed at drain systems that discharge into the Crissy Field marsh.

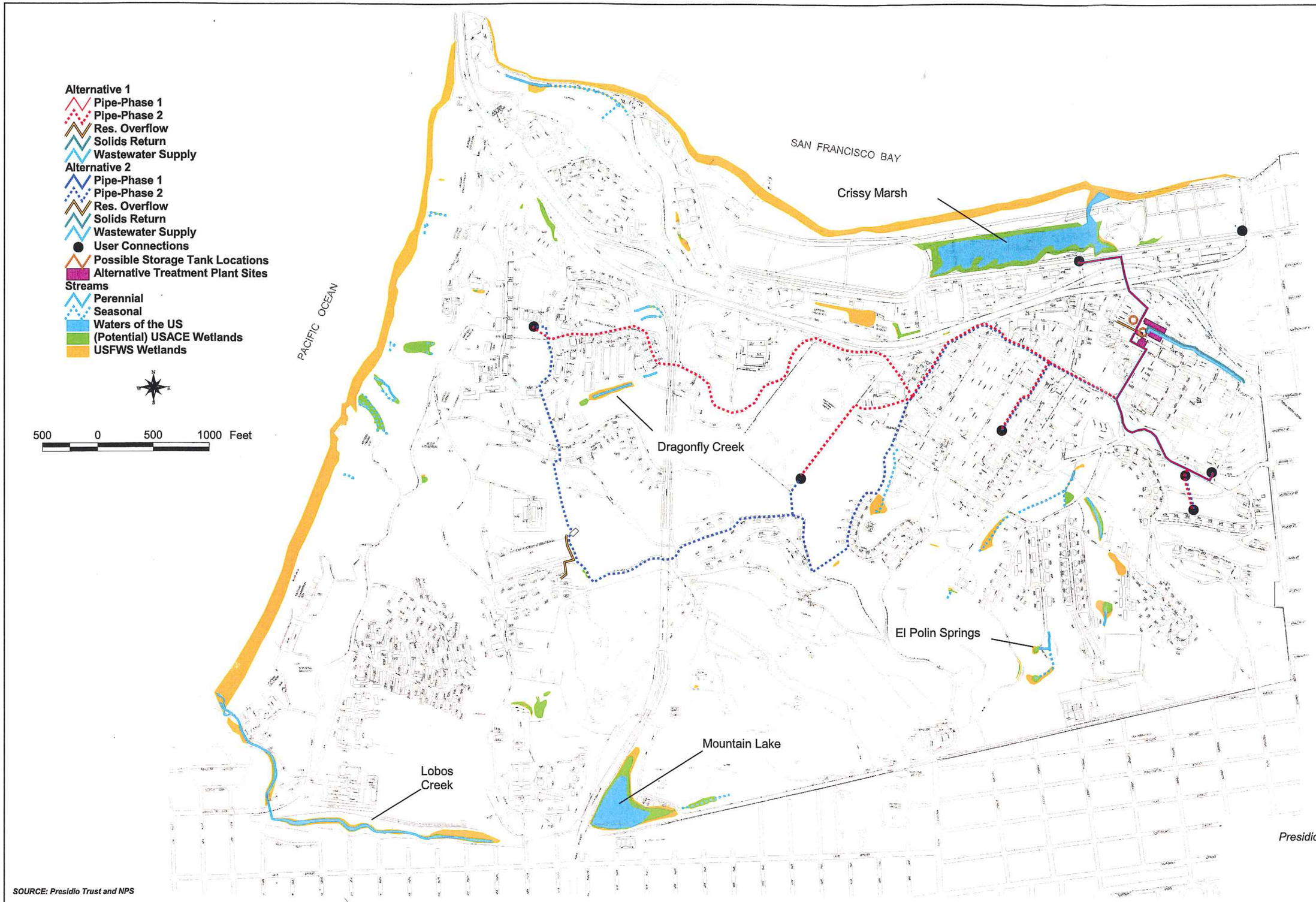
GROUNDWATER RESOURCES

The Presidio's underlying stratigraphy consists primarily of unconsolidated sediment of the Colma formation, which overlies a complex assemblage of sandstone, siltstone, shale, and metamorphic rock known as the Franciscan formation. The Colma formation consists of fine-to medium-grained sand with moderate amounts of clay and silt. Sediments are generally unconsolidated, being deposited in estuarine and coastal environments. Groundwater occurs in both the Franciscan bedrock and overlying Colma formation. Franciscan bedrock aquifers have low yield and are poorly defined because the majority of the groundwater flows through the rock within fractures. Aquifers in Colma Formation materials may produce higher yields than the bedrock aquifers or the shallower groundwater contained in the dune sand aquifers. The Lobos Groundwater Basin within the Colma Formation underlies portions of the Presidio. This groundwater basin formed within alluvial sediments deposited in a depression in the underlying Franciscan Assemblage. Depth to groundwater in the vicinity of Crissy Field is typically about five feet, and the groundwater generally flows north toward the bay (San Francisco County Transportation Authority 2001).

The Trust, in coordination with the National Park Service, is performing park-wide groundwater monitoring to evaluate and document existing groundwater conditions. In areas where the groundwater has been affected by the Army's operations or disposal practices, the Trust is working with regulatory agencies to ensure levels that are protective of human and ecological receptors. Additionally, a surface- and groundwater-monitoring program is underway within the Tennessee Hollow watershed to provide data necessary to support restoration design alternatives. Fifteen wells in the area are continuously monitored to gather data, including depths of aquifers and changes in elevation of groundwater in response to surface water recharge.

WATER SUPPLY AND DEMAND

The water supply for the Presidio is primarily met by diversions from Lobos Creek, which are treated at the Presidio Water Treatment Plant. Diversions from Lobos Creek are limited by natural stream flow volumes and by resource protection objectives (Philip Williams and Associates 1995). Historically, the Army, National Park Service and now the Presidio Trust have purchased supplemental water from the City and County of San Francisco (CCSF) on an as-needed basis. The use of this source has been reduced in recent years due to the partial occupation of the Presidio, and subsequent decrease in water demand. However, supplemental water is still purchased from the City by the Trust. Current average daily water use within the Presidio is estimated at 0.8 MGD, of which approximately half is used for landscape irrigation. The amount purchased from the City varies from year to year, and in 2001 represented approximately 15 percent of the total supply.



Presidio Water Recycling Project

Figure 3.3-1

Wetland Features

SOURCE: Presidio Trust and NPS

WASTEWATER TREATMENT AND DISPOSAL

The storm and sanitary sewer collection systems within the Presidio are two separate systems, in contrast to the CCSF combined sewer system. Storm water at the Presidio is collected in storm sewers and routed to outfalls that discharge into the Crissy Field Marsh, the San Francisco Bay, or the Pacific Ocean. Sanitary sewage is collected from buildings and discharged to the CCSF combined sewer system at one of five locations. These flows are metered by the City and the Trust, and the Trust pays the City for this service. In 2000, average daily flows were approximately 0.4 MGD. Generally, wastewater generated on the east side of the Presidio is routed to the CCSF's Southeast Water Pollution Control Plan (SEWPCP). Wastewater generated on the west side of the Presidio is routed to the CCSF's Oceanside Water Pollution Control Plant (OWPCP). Presidio flows to both plants represent less than one half of one percent of the dry and wet weather capacities of each plant.

3.3.2 REGULATORY BACKGROUND

The major federal legislation governing the water quality aspects of the proposed project is the Clean Water Act, as amended by the Water Quality Act of 1987. The federal Environmental Protection Agency (EPA) is the federal agency responsible for water quality management nationwide.

The State of California's Porter-Cologne Water Quality Control Act provides the basis for water quality regulation within California. The State Water Resources Control Board (SWRCB) administers water rights, water pollution control, and water quality functions, while the Regional Water Quality Control Board (RWQCB) conducts planning, permitting, and enforcement activities. The Porter-Cologne Water Quality Control Act designates the SWRCB responsible for formulating and adopting state policy for water reclamation, while the California Department of Health Services (DHS) is responsible for establishing uniform statewide reclamation criteria to ensure that the use of recycled water would not be detrimental to public health.

There are no federal standards governing wastewater reclamation and reuse in the United States, although the EPA has sponsored the preparation of *Guidelines for Water Reuse*. Many states, including California, have developed wastewater reclamation regulations. In all cases, the regulations have been established with the objective of protecting public health and allowing for the safe use of recycled wastewater. The DHS established water quality criteria, treatment process requirements, and treatment reliability criteria for reclamation operations, which are set forth in Title 22, Division 4, Chapter 3, of the California Code of Regulations (CCR) Water Recycling Criteria. The RWQCB has responsibility for reviewing proposed recycled water projects and for issuing water recycling requirements through the waste discharge permit process. DHS has the responsibility for reviewing proposed water recycling projects and for providing comments and/or recommendations to the RWQCB.

The existing Water Recycling Criteria address treatment requirements for three main types of recycled water uses: landscape irrigation, recreational impoundments, and industrial uses. The

treatment requirements are based on the expected degree of human contact with recycled wastewater under each type of use. Treatment requirements are expressed as treatment process requirements (e.g., bio-oxidation, coagulation) as well as performance standards (e.g., disinfection standards and contaminant reduction).

The existing Title 22 standards are among the most stringent standards for public health protection, and can be more stringent than comparable standards established by the World Health Organization. Since the adoption of Title 22 in 1978, the use of recycled water for nonpotable uses has expanded throughout the state, and is projected to continue to grow over the next several decades. Under Title 22, the proposed use of recycled water for landscape irrigation would fall under the guidelines for "landscape irrigation with high public contact." To be used as a supply source for this designation, the recycled water must be at all times adequately oxidized, coagulated, clarified, filtered, and disinfected wastewater; this process requirement constitutes the most stringent treatment practicable (disinfected tertiary recycled water). To be considered adequately disinfected, the median number of coliform organisms in the wastewater may not exceed a Most Probable Number (MPN) of 2.2 per 100 milliliters over a seven-day period.

WATER RECYCLING PERMIT

Implementation of one of the action alternatives would require that the Trust obtain a water recycling permit from the RWQCB, consistent with the requirements of the California Code of Regulations, Title 22, Division 4 (Environmental Health). As part of the permitting process, an Engineering Report will be submitted to the DHS for initial review and comment, and subsequently to the RWQCB. The Engineering Report will document how the Trust will comply with a variety of requirements as specified in Division 4, Chapter 3 (Water Recycling Criteria), and Article 7 (Engineering Report and Operational Requirements). A summary of these requirements, as well as operational and design stipulations presented in Title 22, are summarized below.

Engineering Report Preparation

Any water recycling project would be required to prepare an Engineering Report, which would address the following items:

- preparation of a contingency plan, which assures that no untreated or inadequately treated wastewater be delivered to use areas;
- implementation of a preventive maintenance program to ensure that all equipment is kept in a reliable operating condition;
- ongoing maintenance of operating reports that document operational practices, maintenance, corrective actions and other analyses specified in the reclamation criteria as established in Title 22 – including monthly reporting requirements with the RWQCB;

- documentation of the installation, maintenance and regular testing of alarm systems at the plant for various functions to ensure against leaks or failures; and
- daily sampling of recycled water and documentation requirements to ensure that applicable water quality criteria are consistently met.

Other Title 22 Compliance Actions

Article 4 of Title 22 provides for a number of standard conditions that would be required for any project in California that uses disinfected tertiary recycled water for landscape irrigation. The proposed project would comply with these provisions, including:

- Posting signs to inform the public in areas where recycled water is in use;
- Prohibition of surface runoff from the area being irrigated as a result of over-application of recycled water, and allowing landscape areas to dry between applications;
- Prohibition on the spray, mist, or runoff from entering dwellings, designated outdoor eating areas, or food handling areas;
- Prohibition of contact between drinking water fountains and recycled water;
- Confining recycled water to authorized use areas;
- Prohibition of physical connections between recycled water systems and potable water systems (except for when backflow preventors are included);
- Prohibition of hose bibs in portions of the recycled water distribution system accessible to the general public;
- Use of purple recycled water distribution and transmission system piping to indicate that it contains recycled water; and
- Other requirements designed to ensure that recycled water use does not adversely affect public health.

The RWQCB will monitor and periodically inspect facilities at the Presidio to ensure that these and other measures required by Title 22 are adequately implemented by the Trust.

3.3.3 ENVIRONMENTAL CONSEQUENCES AND MITIGATION

ALTERNATIVE 1 (CENTRALIZED STORAGE)

Construction Effects on Water Quality

Construction of proposed facilities would involve earthmoving activities such as excavation, grading, and soil stockpiling. Project construction would occur within the relatively flat areas adjacent to one of the three building sites under consideration, and along the pipeline routes.

Unless adequately controlled, project construction could result in soil erosion and subsequent discharge of suspended sediments to nearby surface waters or drainages, including Crissy Marsh. Sedimentation to the waterways could degrade water quality for beneficial uses by increasing channel sedimentation and suspended sediment levels (turbidity), reducing the flood-carrying capacity, and adversely affecting associated aquatic and riparian habitats. Without mitigation, these impacts would be considered potentially significant.

Hazardous materials associated with construction activities, such as fuels, oils, antifreeze, coolants, paints, solvents, and other substances, could adversely affect water quality if released to surface waters. Implementation of the SWPPP as part of the project's BMP-1 (see Section 2.3) for erosion/runoff control would reduce erosion of disturbed soils and release of hazardous materials into watercourses. Implementation of the SWPPP would reduce potential impacts to less-than significant levels.

Pipelines

Construction of the pipelines would be done primarily by open-trench construction. Excavated spoils would be stockpiled along the trench, then utilized for backfill, and excess or unsuitable materials would be transported from the alignment, as necessary. Large-scale stockpiling of spoil materials is not anticipated. Unless adequately controlled, potential impacts associated with open-trench construction techniques could increase downstream sedimentation during trenching activities, potentially impacting water quality by increasing turbidity and sediment deposition. Construction activities would include implementation of BMPs for erosion control along the pipeline routes. No dewatering is anticipated during pipeline construction. Incorporation of standard BMPs, as required under the project Standard Conditions (see Section 2.3, BMP-1: Erosion/Runoff Control) would reduce potential erosion and water quality impacts to less-than significant levels.

Underground Reservoir Construction

Construction of the underground storage tank would be coordinated with planned remediation activities; thus, much of the excavation necessary for construction would already be completed. Excavation at the storage reservoir site would likely encounter groundwater, and may require dewatering to lower local groundwater levels to dry the area for construction. Common practices employed to facilitate construction include either de-watering the excavation (remove groundwater by pumping) or shoring the sides of the excavation to reduce groundwater inflow. If de-watering methods are used, groundwater would be pumped out of the excavation to the surface and then discharged to the sanitary sewer, in accordance with the conditions contained in the Trust's existing Industrial Discharge Permit (IDP). Water extracted during de-watering may contain chemical contaminants (either from pre-existing sources or from equipment) or may become sediment-laden from construction activities, and would be monitored and managed in accordance with applicable regulations. The area of groundwater reduction is generally in the immediate construction area, and the effect on groundwater conditions would be expected to be localized, temporary, and minor.

The impacts to water quality from project construction would be less-than significant, with the implementation of BMP-1.

Operational Effects on Water Quality

Both project alternatives would involve the use of recycled water for landscape irrigation. The proposed treatment process would meet the highest quality recycled water criteria as established by Title 22, which means that the recycled water would be suitable for unrestricted (subpotable) use. This type of recycled water ("tertiary disinfected") can be used for unrestricted irrigation of food crops, parks, playgrounds, school yards and residences, and is acceptable for body contact. In comparison with the potable water presently being used for irrigation, recycled water would have elevated concentrations of a number of constituents, including salts (total dissolved solids, or TDS), nutrients, and other constituents as described below.

Salts

TDS is the sum of all soluble salts, including sodium, chloride, calcium, etc. At elevated levels, TDS can be harmful to plants. However, the predicted level of 410 mg/L in the recycled water associated with this project is relatively low for recycled water, and would not be expected to adversely affect landscape turf or groundwater resources. During the irrigation season, salts may accumulate in the soil column of areas being irrigated with recycled water. These accumulated salts are then flushed from the root zone during the rainy winter months, thereby relieving any salt stresses on landscape vegetation. Once in the local groundwater, the salts would be expected to migrate north toward the Bay for eventual discharge; this portion of the Bay near the Golden Gate is quite turbulent, and any groundwater containing salts or other constituents would be expected to disperse rapidly.

In addition to TDS, another potential concern regarding recycled water is the sodium adsorption ratio (SAR), which is calculated from the proportion of sodium to calcium plus magnesium. Elevated SAR values can be unfavorable to plant growth. However, the predicted SAR value for the recycled water from this project is 2.9, which is within the range of values considered to have no adverse effects on plant growth (Kennedy/Jenks Consultants 2002).

Nutrients

Recycled water typically contains elevated concentrations of plant nutrients, including nitrogen, phosphorus, and potassium. Nitrogen is an essential plant nutrient and a key component of fertilizer; if current landscape fertilization practices were to continue after the implementation of the proposed recycled water project, landscape areas could become stressed due to excess nutrients. However, the Trust and NPS would monitor and modify fertilizer application accordingly (see the Mitigation Measure for WR-1). Potassium does not appear to accumulate in soils, suggesting that its concentration is low compared to the plant requirement. Phosphorus

concentrations may increase in soils over time, indicating that it could be supplied in excess of plant needs. However, similar to other salts, phosphorus would be flushed through the soil column and past the root zones during winter rainy periods (Dames & Moore 1996). The phosphorus would be highly diluted by rainfall and mixing with groundwater, and subsequently would discharge (along with natural groundwater flow) to the turbulent near-shore waters of San Francisco Bay.

Other Constituents

Metals would not be expected to be of concern in the recycled water because no industrial wastewater dischargers exist within the Presidio, and an analysis of the raw wastewater indicated that metals were either not detected or below levels of concern (Kennedy/Jenks Consultants 2002). In addition, any metals present in the recycled water would not be expected to affect groundwater quality because metals are typically removed from water in soils through a complex process of adsorption, precipitation, ion exchange, and complexation (U.S. EPA 1981).

The recycled water could potentially contain trace amounts of pharmaceutical compounds such as antibiotics, steroids, antidepressants, pain killers, estrogen and other hormones (endocrine disruptors). These compounds can pass through the body unmetabolized or partially metabolized, and can be present in domestic wastewater in the range of a few parts per billion to a few parts per trillion. These and other compounds are collectively known within the water industry as "emerging contaminants", and are not presently regulated at the federal, state or local level, although their environmental fate, transport, and health effects are the subject of on-going research (Debroux 2002).

Approximately 500 million gallons of treated wastewater are presently discharged to the San Francisco Bay on a daily basis, and consequently these emerging contaminants are presumed to presently exist in the Bay water at extremely low levels. The proposed recycled water treatment processes (membrane bioreactor and UV disinfection) would remove a greater portion of these compounds from the wastewater than are typically removed in conventional wastewater treatment processes. Therefore, these compounds would likely be present in the recycled water at concentrations less than that of typical wastewater treatment plant discharges, and near or below current analytical detection limits. The presence of trace amounts of these compounds in the recycled water would not adversely affect landscape irrigation or any other proposed uses of the recycled water at the Presidio. If present, these compounds would likely be further broken down by natural processes in the soil column, and would not be expected to adversely affect groundwater quality. During the irrigation season, the recycled water would be applied to landscaped turf areas only to meet the evapotranspiration requirements, and would not produce surface runoff or percolate through the soil to groundwater. It is unlikely that the minute quantities of these compounds, if present, could migrate through the soil and into groundwater during the wet weather season, and then subsequently migrate to the near-shore waters of San Francisco Bay and Crissy Marsh. If this migration were to occur, the concentrations would be extremely low, if even detectable, and would be unlikely to increase existing background levels in the Bay water.

Operation of the proposed project would comply with all pertinent requirements of the RWQCB, DHS, and Title 22. Compliance with applicable regulations would ensure that high quality water is consistently produced, monitored, and carefully applied, and that the potential impacts to water quality from landscape irrigation of recycled water would be less-than significant.

> **Mitigation Measure WR-2:** The Trust would monitor the total nitrogen levels in the recycled water, and adjust the applied fertilizer to turf or landscape vegetation downward accordingly. This would avoid potential problems associated with excess nutrients stressing the turf areas irrigated with recycled water, and would reduce the amount of nitrogen contributed to local groundwater.
>
> *The impacts to water quality from landscape irrigation would be less-than significant, with the implementation of Measure WR-2.*

Effects on Water Resources Management

Implementation of Alternative 1 would generate up to 0.5 MGD of recycled water for irrigation or other non-potable uses at the Presidio. Current average daily water demands at the park are approximately 0.8 MGD – and roughly half of this total is used for irrigation. The availability of a drought-proof, high quality source of water for landscape irrigation would reduce the amount the potable water consumed for non-potable uses. Over time, as buildings are rehabilitated and occupied at the Presidio, the demand for water is expected to increase and the use of recycled water would provide an alternate, sustainable source of water.

> *This would be considered a beneficial effect, and no mitigation is recommended or required.*

Effects on Wastewater Flows

Implementation of Alternative 1 would reduce the amount of Presidio wastewater flows entering the City's system. During peak irrigation periods, roughly 80 percent of the sanitary flows currently leaving the park for treatment and disposal via the City's SEWPCP would be captured and reused on–site. During the winter months when demand for irrigation is low, the need for sanitary flows at the water recycling plant would also be low. During this period, wastewater flows would either continue to flow as they currently do to the City's system for treatment and disposal, or could be treated and temporarily stored on-site during peak wet weather events. During these events, it would be possible to treat and store on-site up to 500,000 gallons of recycled water. This type of storage is included in this alternative at the request of the City to assist in the reduction of flows during major storm events. During these events, the City's SEWPCP combined sewer and stormwater system can experience overflows. In addition to this temporary storage capacity, several other actions have been taken (independent of this project) to

further reduce the amount of wet weather flows entering the City's system. The Trust has and continues to repair the existing sanitary sewer system and implement aggressive domestic water conservation measures that will help to reduce the Presidio's contribution to sanitary flows. Overall, the amount of current Presidio flows contributed to the SEWPCP represents less than one half of one percent of the plant's wet-weather capacity.

Implementation of Alternative 1 would reduce amount of annual Presidio sanitary flows entering the City's system. This would be considered a beneficial effect, and no mitigation is required or recommended.

Effects on Groundwater Flow

Construction of an underground storage reservoir (either Option A or B) would result in the placement of a cylindrical steel or concrete tank approximately 80 feet in diameter and 20 feet deep. This structure could impede the natural flow of groundwater. Groundwater in this area flows north, toward the Bay, and would be expected to be present approximately five feet below ground surface. Groundwater would be intercepted on the upstream (south) side of the tank, and would then flow under or laterally around the tank. Subsurface areas immediately down-gradient of the tank may have interrupted flow, but within one to two tank diameters groundwater flow conditions would be expected to return to their natural state. Given the size and circular structure of the proposed tank, groundwater would be expected to flow easily around the tank, and continue to deliver a similar quantity of water to down-gradient areas, including Crissy Marsh and the Tennessee Hollow restoration area, which are located approximately 1,000 feet north (down-gradient) of the proposed tank locations.

This would be considered a less-than significant effect, and no mitigation is recommended or required.

ALTERNATIVE 2 (MULTIPLE STORAGE SITES)

General Effects on Water Resources

Implementation of Alternative 2 would be essentially the same as described above for Alternative 1. The main difference would be regarding the potential for wet-weather flow reduction to the CCSF Eastside system. A potential alternative for the re-routing of wet weather flows may provide additional benefits; however, this option would require additional analysis and discussion with the City. If possible to implement this re-routing option, there could be additional beneficial effect when compared to Alternative 1. Based on the relative size of the Presidio's contribution to wet weather flows (less than one half of one percent of the City's plant capacity), this additional benefit would be small.

Alternative 2 would have no significant impacts on water resources, with implementation of mitigation measures identified under Alternative 1. Beneficial effects would also be similar and possibly greater than those described under Alternative 1.

ALTERNATIVE 3 (NO ACTION)

Effects on Water Resources

Under the No Action Alternative, recycled water would not be used at the Presidio and all of the park's water needs would continue to be met 100 percent by potable water. The Trust would, however, implement aggressive water conservation practices to maximize water savings. None of the systems/facilities described above for the two action alternatives would be constructed. Implementation of the No Action alternative would therefore avoid all impacts (both adverse and beneficial) described above for the project alternatives.

The No Action Alternative would avoid all effects (beneficial and adverse) as described above for Alternative 1.

3.4 BIOLOGICAL RESOURCES

3.4.1 AFFECTED ENVIRONMENT

The project "study area," as used in this biological resources section, encompasses all project components proposed under each alternative, including treatment, storage, and distribution facilities, and adjacent habitats or resources that could be directly or indirectly affected by the construction and operation of the proposed project. The evaluation of the potential effects on biological resources is based on the footprint of the project components and operations, a 20-foot wide limit of construction along the distribution pipelines, and the location of project components relative to sensitive resources identified in the project study area, as described above. The local context for the proposed project is the Presidio of San Francisco; the greater regional context for the proposed project is the City and County of San Francisco. It is important to note that proposed project facilities were sited to avoid sensitive biological resources, and would be located either within an existing building or within existing roadways (except for two small pipeline segments that cross through a landscaped area and portion of the historic forest under Alternative 2).

VEGETATION AND WILDLIFE

Many of the native plant communities in the Presidio are remnant populations of communities that were once extensive along the coast of California. These native plant communities have been displaced by urban development or non-native species that rapidly colonize disturbed open areas. Under current conditions, both native and non-native plant communities occur in the project study area. The recently adopted the *Presidio Vegetation Management Plan* (*VMP*) (Trust and NPS 2001) delineates three management zones at the Park, historic forest, native plant communities and landscape vegetation, and prescribes management actions for each zone. Figure 3.4-1 provides an overlay of each zone with the various project components. Although species diversity is often low in the Presidio for much of the wildlife, the diversity and richness of bird species is remarkably high for such a small area. More than 200 bird species are known to occur in the Presidio, as many as 50 of these for nesting (Jones and Stokes 1997). Biological resource surveys conducted for this project documented site conditions similar to those identified in the *Presidio of San Francisco Natural Resource Inventory and Vegetation Management Options* (Jones and Stokes 1997). For additional background on Presidio wildlife, please refer to this report. A copy is available at the Presidio Trust Library.

Native Plant Communities

The native plant communities and assemblages located in the project study area, which includes areas adjacent to recycled water users and the limits of construction, include a remnant coast live oak assemblage, central coast arroyo willow riparian scrub, coastal salt marsh, northern foredune and central dune scrub. Please refer to the *VMP* (2001) for further discussion about these plant communities. These plant communities and assemblages mostly occur adjacent to roads along

SOURCE: Presidio Trust and NPS

Presidio Water Recycling Project

Figure 3.4-1

Vegetation Management Plan

the various project alignments. Understory vegetation in the Rob Hill area section of the proposed alignment includes small patches of native plants, as do some understory areas south of Infantry Terrace and east of the Cemetery.

Presidio Vegetation Management Plan (VMP)

The adopted *VMP* (Trust and NPS 2001) was prepared jointly by the Trust and NPS to serve as a comprehensive management framework for the Presidio. It defines management actions for the revitalization of each of the three landscape management zones occurring at the Park: native plant communities, historic forest and landscape vegetation. The VMP consists of management objectives, standard protective measures (mitigation), and other actions that would be applied to this project.

SPECIAL STATUS SPECIES

A reconnaissance-level survey of the project study area was performed by ESA ecologists on November 5, 2001. The purpose of these visits was to gather information on available plant and wildlife habitats and habitat use on and surrounding the project study area, and to verify the results of previous biological reports. All undeveloped project areas not contained within roadways or developed areas were surveyed, including adjacent habitats that appeared suitable for special status species. Based on survey findings and a review of previous studies, formal protocol-level surveys for listed plant and wildlife species were not warranted for this analysis. A list of special status species potentially occurring in the Presidio or that previously occurred in the Presidio is presented in Appendix A.

Plants

A total of fourteen special status plant species are known to occur in the Presidio, five of which are federally and/or state-listed (i.e., endangered or threatened) and occur on serpentine and/or sandy soils (see Appendix A). None of these special status species occur within the limit of the construction of the project study area (NPS 2000, NPS and Trust 2001). As part of the Crissy Field marsh and dunes restoration effort, special status plant species (i.e., California seablite, San Francisco lessingia, dune gilia and San Francisco spineflower) were introduced. Of these species, California seablite occurs along coastal saltmarsh margins, and the remaining species occur in adjacent dunes. Only California seablite is located adjacent to a landscape irrigation site.

Wildlife

Of the eleven special status invertebrates that occur regionally, only monarch butterfly (*Danaus plexippus*) is believed to occur in or adjacent to the project study area (Presidio Trust 2001). While individual monarch butterflies hold no federal or state protection status, overwintering grounds for this species are considered significant and unique by the State of California and are protected by the CDFG. This species has historically overwintered in a eucalyptus grove located north of Kobbe Drive, approximately 250 feet north of a proposed pipeline segment under Alternative 2 (Presidio Trust 2001). The monarch butterfly could continue to overwinter at this

location between the months of November and March, and an analysis of the project's effect on overwintering monarch butterfly is provided below.

Many nesting passerine birds that are protected by the federal Migratory Bird Treaty Act (MBTA) and possibly nesting raptors (protected by the MBTA and CDFG Code 3503.5) may occur in the Presidio project study area during the nesting season (February 15 through August 15). This includes several locally uncommon birds that have been identified on the Presidio, and others for which suitable habitat has been identified. A brief list of these species includes great horned owl (*Bubo virginianus*), Hutton's vireo (*Vireo huttoni*), California quail (*Callipepla californica*), wrentit (*Chamaea fasciata*), common yellowthroat (*Geothlypis trichas*), sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*Accipiter cooperii*), and American kestrel (*Falco sparverius*) among others.

A 1994 acoustic bat survey conducted in support of the *Presidio Natural Resource Inventory and Vegetation Management* report identified the occurrence of Yuma myotis (*Myotis yumanensis*), a federal Species of Concern (Pierson and Rainey 1995, as cited in Jones and Stokes 1997). Pierson and Rainey concluded that at least five additional special status bats could potentially occur at the Presidio; however, habitat conditions or available insect food at the Presidio did not appear suitable for any of these species at the time of the survey (see Appendix A) (Jones and Stokes 1997). In support of the current analysis, an independent bat biologist confirmed the absence of suitable roosting habitat for special status bats in the three existing buildings that could be altered by the proposed project (Buildings 1040, 1062, and 1063) (Tatarian 2002). No other habitat was identified near the proposed project.

WETLANDS

None of the alternatives would directly impact existing wetlands. Several wetlands occur in close proximity to the project study area and are further evaluated later in this section below (Figure 3.3-1).

REGULATORY BACKGROUND

Special Status Species

As defined in this document, species are accorded "special status" because of their recognized rarity or vulnerability to various causes of habitat loss or population decline. Some are formally listed and receive specific protection defined in federal or state endangered species legislation. Other species have no formal listing status as threatened or endangered, but have designations as "rare" or "sensitive" on the basis of adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, such as the California Native Plant Society.

Migratory Bird Treaty Act (MBTA)

The Federal Migratory Bird Treaty Act (16 U.S.C., Sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the

Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs. Migratory birds include geese, ducks, shorebirds, raptors, songbirds and many others. The Migratory Bird Executive Order of January 11, 2001 directs executive departments and agencies to take certain actions to further implement the MBTA, and defines their responsibilities of each federal agency taking actions that have, or are likely to make, a measurable affect on migratory bird populations. All project actions within the Presidio must comply with this act; therefore, they cannot result in unauthorized take of migratory birds. The Best Management Practices (BMPs) identified in Chapter 2 as part of the project would require preconstruction surveys during the nesting season, would prohibit disturbance of active nests, and would ensure that protected bird species that are nesting would not be destroyed or disturbed by the proposed construction activities.

Invasive Species

The National Invasive Species Council oversees implementation of the Executive Order on Invasive Species (13112), which directs federal agencies to prevent the introduction of potentially invasive non-native species and control invasive species on lands for which they are responsible. The Trust implements this requirement through protective measures provided in the Vegetation Management Plan (see below).

3.4.2 ENVIRONMENTAL CONSEQUENCES & MITIGATION

ALTERNATIVE 1 (CENTRALIZED STORAGE)

Effects on Vegetation

None of the locally-occurring special status plant species (listed in Appendix A) would be directly or indirectly disturbed by the proposed project construction activities. Except for a small remnant assemblage of coast live oaks (three trees), all of the identified native plant communities lie adjacent to irrigated areas. The coast live oaks are located in the proposed Lombard Area A recycled water use area (Phase 2). The area surrounding the oaks is currently irrigated, and no adverse impacts to these oaks have been identified, and none are anticipated. All other areas to be irrigated with recycled water are comprised of landscape vegetation. Pursuant to the permit requirements associated with use of recycled water, irrigation or runoff to adjacent native plant communities would be avoided (see Section 3.3, Water Resources.

Although the proposed pipeline alignment under Alternative 1 is primarily located in the road and would have little impact on vegetation, the roots of historic forest trees (i.e., along Lincoln Boulevard) could be directly affected due to trenching activities. Since the canopy of these trees overhang the construction corridor in the road, the roots of these trees likely occur below the paved road and could be removed or damaged during trenching activities. The closer the trench is to the trunk of the tree, the greater the damage. Each root that is removed (cut) reduces the tree's capacity to supply water and nutrients to the leaves. Placement of the proposed pipeline alignment on the south side of Ruckman Road and Rod Road would avoid impacts to these trees.

Many of these trees along the proposed pipeline alignment are in poor health, and as a result, would likely be replaced as part of the Trust's forest rehabilitation program, which was proposed in the VMP. Actions proposed under Alternative 1 would be coordinated with the forest rehabilitation program to avoid effects on trees due to implementation of this proposed project.

Placement of underground reservoir facilities under alternative site A would not affect any vegetative resources. Use of alternative site B for underground storage could directly affect 5 to 10 landscape trees within the existing parking lot. Landscape vegetation would be replaced or added as part of the project under both proposed facility options consistent with BMP-4 (see Chapter 2), and no significant biological effects would occur.

> **Mitigation Measure BR-1:** Construction of the proposed pipeline along Ruckman and Rod Roads Phase 2 (Alternative 1) would be kept to the south side of the roadway to minimize potential effects on adjacent trees.
>
> *Effects on vegetation would be less-than significant following implementation of Measure BR-1 and BMPs.*

Effects on Wildlife

Common Wildlife

Effects on common wildlife species in adjacent areas could occur during equipment staging or during earthmoving or construction activities. Affected animals may include snakes, lizards, nesting birds, and small mammals such as mice and gophers. Temporary disturbance would occur during construction, and would include equipment noise and movement, which may temporarily displace animals. Relatively minor effects on common wildlife species are generally considered less-than significant, with no specific mitigation required. Larger wildlife species that may move through the Presidio (such as opossum and raccoon) would not be affected by project activities.

Birds

Construction activities have the potential to indirectly affect nesting raptors and special status birds protected under the MBTA. Nesting habitat for several non-listed special-status raptor species and other birds occurs in trees located throughout the project area. Nesting habitat for red-shoulder hawk occurs in eucalyptus and Monterey pine trees throughout the Alternative 1 proposed pipeline route, but particularly in forested areas neighboring the San Francisco National Cemetery. No active hawk nests were observed during surveys in November 2001, but this species and other raptors (including red-tailed hawk and American kestrel) are expected to nest in eucalyptus trees on the Presidio.[1] Human disturbances from construction activities have the

[1] This species, as with all raptors, is protected under the federal Migratory Bird Treaty Act.

potential to cause nest abandonment and death of young or loss of reproductive potential at active nests located near the project site.

Other special status bird species potentially breeding near the construction right-of-way include shrub-nesting species such as loggerhead shrike and birds protected under the MBTA. Effects on these species during project construction include the potential for temporary disturbance of suitable nesting and foraging habitat located near construction sites. Disturbance of raptors and other nesting birds as a result of project implementation would be avoided through the standard BMPs implemented as part of the project to reduce environmental effects (see Section 2.3, BMP-4: Biological Resource Protection).

Impacts to common and special status wildlife species during construction would be less-than significant, with the implementation of BMP-4.

Construction Effects on Wetlands

A small segment of Dragonfly Creek is located directly south of Appleton Street where a proposed recycled water distribution pipeline would be located during Phase 2 of Alternative 1 (see Figure 3.3-1). The construction activities would be contained entirely within the roadbed, and no direct impact to the creek would occur. Possible indirect effects could include sedimentation from runoff at the adjacent construction site. This potential impact would be effectively reduced through the implementation of the BMPs identified in Chapter 2. The remaining downstream segment of the creek is captured in an underground culvert that crosses under Lincoln Avenue en-route to the San Francisco Bay. The recycled water distribution pipeline would also be located within Lincoln Avenue, and future construction activities would be designed to avoid the existing culvert. Crissy Marsh is located adjacent to a proposed Phase 1 pipeline; however, construction activities would be contained entirely within the Mason Street roadway, and construction activities would not impact the marsh (directly or indirectly).

The impacts to wetlands from project construction would be less-than significant, with the implementation of Measures BMP-1 and BMP-4.

Indirect Operational Effects on Biological Resources

As discussed in Section 3.3, Water Resources, recycled water would contain low levels of soluble salts and nutrients. During the winter rainy season, a small amount of salts and nutrients (such as nitrogen and phosphorus) would be flushed from the soil column and mixed with native groundwater. Theses constituents would be substantially diluted by the rainfall and groundwater, and would not be expected to have a measurable effect on adjacent vegetation which includes California seablite (at Crissy Marsh) or groundwater quality. With implementation of Mitigation

Measure WR-1, the Trust would monitor and modify fertilizer application accordingly to avoid production of excess nutrients, such as nitrogen, that could cause plant stress.

Recycled water could also potentially contain trace amounts of pharmaceutical compounds such as antibiotics, steroids, antidepressants, pain killers, and hormones (endocrine disruptors) in the range of a few parts per billion to a few parts per trillion. These and other compounds are collectively known as "emerging contaminants," which are not presently regulated at the federal or state level, although their environmental effects, fate, and transport are the subject of on-going research. A general concern with treated effluent discharges is the potential for endocrine disruptors to modify the normal functioning of human or wildlife endocrine systems, for example, by mimicking natural hormones, blocking the effects of natural hormones, or stimulating the overproduction or underproduction of natural hormones (EPA 2000, Tucker 2002). However, neither of the project alternatives evaluated in this EA would result in the discharge of treated effluent into surface waters. Recycled water would only be used for landscape irrigation.

It is unlikely that the minute quantities of these pharmaceutical compounds present in the recycled water would migrate through the soil and into groundwater after a storm event, and subsequently migrate to the near-shore waters of San Francisco Bay and Crissy Marsh. Consistent with the permit requirements (see Section 3.3) associated with recycled water use, water would be carefully applied to landscaped areas in quantities intended to meet the evapotranspiration requirements of the area, and to preclude surface runoff. However, if the compounds were to migrate from adjacent landscaped areas into surface waters, concentrations would be so low that no measurable effects would occur, and would likely be comparable to existing background levels present in San Francisco Bay. In addition, the proposed water recycling treatment process (membrane bioreactor and UV disinfection) would remove a greater portion of these compounds from the wastewater than are typically removed in conventional wastewater treatment processes. For additional discussion of water quality effects, please refer to Section 3.3 of this EA.

No adverse effects are anticipated to adjacent marsh plants, or biological resources associated with the aquatic habitats of Crissy Marsh and San Francisco Bay, and therefore no mitigation is required or recommended.

ALTERNATIVE 2 (MULTIPLE STORAGE SITES)

Effects on Vegetation

The majority of the proposed pipeline construction would occur within existing roadways or paved areas, and would not directly impact vegetation. Construction of Phase 1 facilities would be identical to those described under Alternative 1, and minimal effects on vegetation would occur. There are several areas where Phase 2 pipelines would leave existing roadways, and cross

through forested or landscaped areas. A description of each and the potential impact on existing vegetation are provided below.

Approximately 300 feet of pipeline would be constructed along the slope separating Washington Boulevard and Thomas Avenue (at Infantry Terrace). The proposed pipeline would be contained within an existing utility corridor. In 1995, the NPS cleared the vegetation along this corridor to construct a fiber optic line. This alignment was identified specifically to avoid or minimize impacts to vegetation. Existing vegetation within this corridor is sparse.

Another pipeline segment (approximately 600 feet in length) that would deviate from paved areas occurs between the abandoned reservoir (near Central Magazine) and Hitchcock Street. This area contains historic forest, primarily eucalyptus trees. Based on the age and condition of these trees, this area has been identified for reforestation and rehabilitation as part of the adopted VMP. Construction of the proposed pipeline in this area would likely require tree removal and, consistent with the VMP, this activity would be coordinated with the planned reforestation to ensure that removal of healthy vegetation is minimized and the long-term viability of the forest is protected. Additionally, vegetation clearing would also occur within the fenced perimeter of the abandoned reservoir during its rehabilitation. Consistent with BMP-4, Trust Natural Resource staff would identify plant material to be salvaged and/or invasive non-native plants that must be carefully managed in accordance with this measure. There is also one small segment (approximately 150 feet) of proposed pipeline that leaves the road prism and crosses an existing trail between the San Francisco National Cemetery and Nauman Road. Although the area surrounding the trail consists of eucalyptus trees, no tree removal would occur as the pipeline would be located within the existing trail corridor.

All construction activities would be done in accordance with the BMPs set forth in Chapter 2, which include erosion control practices and measures to prevent the spread and/or introduction of invasive, non-native plant materials into the project area. Because the proposed recycled water use areas are the same under both action alternatives, the operational effects are also the same and would be less-than significant (see analysis provided for Alternative 1). The removal of existing vegetation at the Presidio would be conducted in compliance with the VMP, which provides for the phased removal and replacement of aging forest resources.

Project effects on vegetation would be less than significant following implementation of Measure BMP-4 and adherence to the VMP.

Effects on Overwintering Monarch Butterflies

The monarch butterfly has been observed overwintering on the Presidio during the months of November through March in areas that support dense, sheltered eucalyptus groves. This overwintering phenomenon is considered sensitive by the California Department of Fish and Game (CDFG), and the Trust seeks to minimize potential effects on this activity. The Presidio is

located within the northern unit (which extends from San Mateo to Sonoma Counties) of the monarch's overwintering range (Monroe 2002). The only project component located near potential overwintering habitat under Alternative 2 would occur during Phase 2, along one small segment of the proposed pipeline at Rob Hill, between Compton Road and Hitchcock Street. In the past, monarchs have been observed overwintering in eucalyptus trees within the general vicinity (approximately 250 feet north of the proposed pipeline segment). Last year, monarchs were not detected in this location; however, it is possible that they may return in the future. Although monarchs have not been observed in the eucalyptus trees within or directly adjacent to the proposed pipeline corridor, there appears to be suitable overwintering habitat in this area.

During overwintering, monarchs do not appear to be highly sensitive to noise, movement or visual intrusion from nearby people or vehicles. Smoke (i.e., from control burns or wildfires), excessive dust, or exhaust can agitate the butterflies, causing excessive movement and corresponding reduction in their limited fat supplies/strength. What appears to have the greatest potential influence on overwintering, however, are long-term microclimate changes. Prolonged cold and moist conditions are considered adverse to overwintering. Vegetation removal, manipulation of water bodies, or other activities that can alter local wind, temperature or moisture settlement patterns can lead to such changes in microclimate (Monroe 2002).

Prior to construction of the proposed Phase 2 pipeline (in approximately 10 years), current monarch monitoring data would be reviewed to determine the presence/absence of overwintering activity in the general area. If monarchs have been observed, the Trust would seek to minimize the potential short- and long-term effects. Construction activities would be scheduled, to the degree feasible, outside of the overwintering period. However, based on the monarch's relative tolerance of human presence and the short construction period (likely to be less than a week in this location), the impact would not be considered significant. In addition, implementation of the BMPs for dust control and other relevant measures would further reduce the potential for construction-related disturbances.

Construction of the proposed pipeline would likely require the removal of individual trees, which has the potential to generate short-term microclimate changes until newly planted saplings mature. If monarchs are determined to be present in this general area, the pipeline corridor would be evaluated and the alignment and/or proposed tree removal designed such that it ensures adequate buffers to prevent indirect microclimate changes in the overwintering areas. As described in the analysis of vegetation effects, this entire area of historic forest has been identified for reforestation and rehabilitation in the adopted VMP. Consistent with the VMP, the proposed pipeline construction activities would be coordinated with this effort. Future implementation of the rehabilitation and reforestation project within or adjacent to potential overwintering habitat may require additional analysis at the time this activity is proposed. Information on the current conditions of the area, as well as the design and layout of the proposed reforestation effort, would be fully evaluated, and mitigation identified and implemented as needed.

> **Mitigation Measure BR-6:** Prior to construction of the proposed Phase 2 (Alternative 2) pipeline near Rob Hill, Trust natural resource staff would review the last several years of

overwintering data to determine the presence and extent/absence of monarch activity surrounding the proposed construction area. If overwintering activity has occurred within this area, construction would be scheduled outside of the November to March period to the greatest extent feasible. The location and extent of overwintering habitat will also be considered in the refinement of the proposed pipeline alignment and corresponding need for tree removal. This refinement would be done to ensure that appropriate buffers are established so that adverse changes in the microclimate of the overwintering area are avoided.

Following implementation of Measure BR-6, project effects on monarch butterfly would be less-than significant.

Effects on Wildlife

Under Alternative 2, project effects to common wildlife, nesting raptors and special status bird species would be essentially the same as described as Alternative 1. Effects on common wildlife and bird species have the potential to be slightly greater under Alternative 2, as the project route would traverse three undeveloped eucalyptus woodland areas under this alternative (i.e., (1) between San Francisco cemetery and Nauman Street along an existing social trail, (2) in an existing utility corridor north of building 1469 (existing reservoir), and (3) between Washington Boulevard to Thomas Avenue).

As discussed under Alternative 1, relatively minor impacts to common wildlife species are generally considered less-than significant, with no mitigation required. Direct project-related disturbance to raptors and other nesting birds as a result of project implementation would be avoided through the implementation of BMP-4. As a result, additional mitigation is not required for these potential project effects.

Alternative 2 would have similar impacts as Alternative 1, and are considered less-than significant.

Construction Effects on Wetlands

Approximately 300 feet of pipeline would be constructed along the slope separating Washington Boulevard and Thomas Avenue (at Infantry Terrace). The proposed pipeline would be contained within an existing utility corridor. Existing vegetation along the corridor is sparse; however, there are vegetation indicators that a wetland could be forming. Existing vegetation would be removed during construction activities. Prior to Phase 2 construction (in approximately 10 years), the site would be inspected again to evaluate wetland indicators.

An USACE jurisdictional unnamed wetland lies approximately two feet from Compton Road adjacent to a proposed pipeline. This feature lies outside the limit of construction and would not

be directly affected by project construction activities. Implementation of BMP-4 would prevent indirect effects including potential sedimentation and runoff from trenching activities into these wetlands.

Mitigation Measure BR-8: Prior to construction of the proposed Phase 2 (Alternative 2) pipeline along the slope separating Washington Boulevard and Thomas Avenue (at Infantry Terrace), the water-associated feature will be delineated using U.S. Army Corps of Engineers USACE methods by a qualified specialist. If this feature meets jurisdictional requirements of the USACE, the Trust would ensure compliance with Section 404 of the Clean Water Act.

Impacts to wetlands would be less-than significant under Alternative 2 with the implementation of Mitigation Measure BR-8, BMP-1 and BMP-4.

Indirect Operational Effects on Biological Resources

Under Alternative 2, potential indirect effects of project operation would be the same as described for Alternative 1. No adverse effects are anticipated to adjacent marsh plants, or biological resources associated with the aquatic habitats of Crissy Marsh and San Francisco Bay.

No adverse effects to biological resources are anticipated as a result of project operation, and thus no mitigation is required or recommended.

ALTERNATIVE 3 (NO ACTION)

General Effects on Biological Resources

Under the No Action Alternative, none of the proposed water recycling facilities would be implemented, and all on-site irrigation demands would continue to be met with potable water from Lobos Creek and/or purchased from the CCSF. Although the No Action alternative would result in increased demands placed on the Presidio's water supply system in the future, the 500,000-gallon minimum flow requirement would continue to protect natural resources along the creek. None of the biological impacts described above for the two action alternatives would occur.

Under Alternative 3, all of the biological effects associated with the two action alternatives would be avoided.

3.5 CULTURAL AND HISTORIC RESOURCES

3.5.1 AFFECTED ENVIRONMENT

The Presidio of San Francisco (Presidio) was designated a National Historic Landmark District (NHL) in 1962. With a period of significance from 1776 to 1945, the Presidio is recognized for its use as a Spanish colonial, Mexican, and U.S. Army military post.

In 1993, the landmark designation was updated to further identify this valuable resource (1993 NHL Update). At that time, more than 650 buildings, sites, structures and objects were considered as contributing to the significance of the NHL District. The update includes both archaeological and cultural landscape resources. Buildings that are contributing and non-contributing to the NHL designation are identified in Figure 3.5-1. Included in this Figure are four buildings subject to this Environmental Assessment; they are buildings 1040, 1062, 1063, and 1469. Information presented below was provided by the *Historic Buildings of the Presidio: Physical History Reports* (NPS no date) and the *NHL Update.*

The Area of Potential Effect (APE) for historic buildings are each of the individual building's interior and exterior features. The APE for both archaeology and cultural landscapes follows the construction activity zone including areas where ground disturbing activities could occur. The APE is show on Figure 3.5-2.

HISTORIC ARCHITECTURE

Building 1040 is a two-story brick structure constructed in 1900 as a powerhouse and steam plant. In 1909, two wing additions were completed at the north side of the building. It was altered again after 1942 to include the removal of a slate hip roof and circular brick smokestack. The second story and flat roof were added sometime before 1967. Exterior features such as the common bond brickwork, arched windows and door openings, and stone elements are considered highly sensitive to alteration. The building's historic use is technologically significant as one of the earliest powerhouses at the Presidio. As such, interior elements, the exposed brickwork, catwalk, some equipment, arched openings, and original wood doors, are highly sensitive to alteration.

Building 1062 is a two-story reinforced concrete structure constructed in 1922 as a quartermaster's shop. It includes a loading dock along the entire southern façade. The building retains its Spanish-tiled hip roof with exposed rafter tails. The 1948 alteration to a theater use infilled the building's double hung windows. Despite the theater adaptations, the building retains much of its original form, shape and materials. Exterior features highly sensitive to alteration include two circular roof vents, exposed wood frame concrete walls, the concrete loading dock, the fenestration pattern, simple rafter tails, and iron bars over some windows. Interior elements

highly sensitive to alteration include the reinforced concrete skeleton of post and beams, exposed steel roof trusses, and the wooden formwork clearly seen on the concrete walls and ceiling.

Building 1063 is a large one-story wood frame and corrugated metal warehouse constructed in 1941 as a medical supply warehouse. Exterior elements highly sensitive to alteration include the axial gable roof, corrugated iron exterior siding, six circular roof vents, the fenestration pattern, sliding warehouse doors, and six-light hopper windows. Interior features highly sensitive to alteration include the open warehouse space, concrete slab floor, and exposed structure.

Building 1469 is a deep concrete structure built in 1897 as a reservoir. The two-compartment structure has a wood-frame cover with shiplap siding and gabled roof. It retains much of its original character, experiencing little to no modification.

ARCHEOLOGICAL RESOURCES

Areas of known and predicted archaeological sensitivity within the Presidio were first identified in the 1993 NHL Update, which took a predictive and sensitivity approach to identification of historic archaeological resources that contribute to the NHL. The 1993 NHL Update treated the Presidio as a single archaeological site or property with numerous contributing features that are functional components of a single long-term military occupation. An effort was also made during this update to identify those areas where prehistoric sites (i.e., associated with Native American use prior to European contact) could be expected based on site locations known in other areas of the San Francisco region. Today, a digital sensitivity map is maintained in the Presidio Archaeology Lab, a joint facility of the Presidio Trust and National Park Service. It is continually revised using new information from historical research, field monitoring, and geomorphological analyses. The archaeological sensitivity map and accompanying data bases contain information on prehistoric and historic features throughout the Presidio, which span the time period of Native occupation, and the Spanish (1776-1822), Mexican (1822-1846) and American (1846-1994) military occupations. This map was used as the basis for evaluating the alternatives' potential effect on archaeological resources (see Figure 3.5-2).

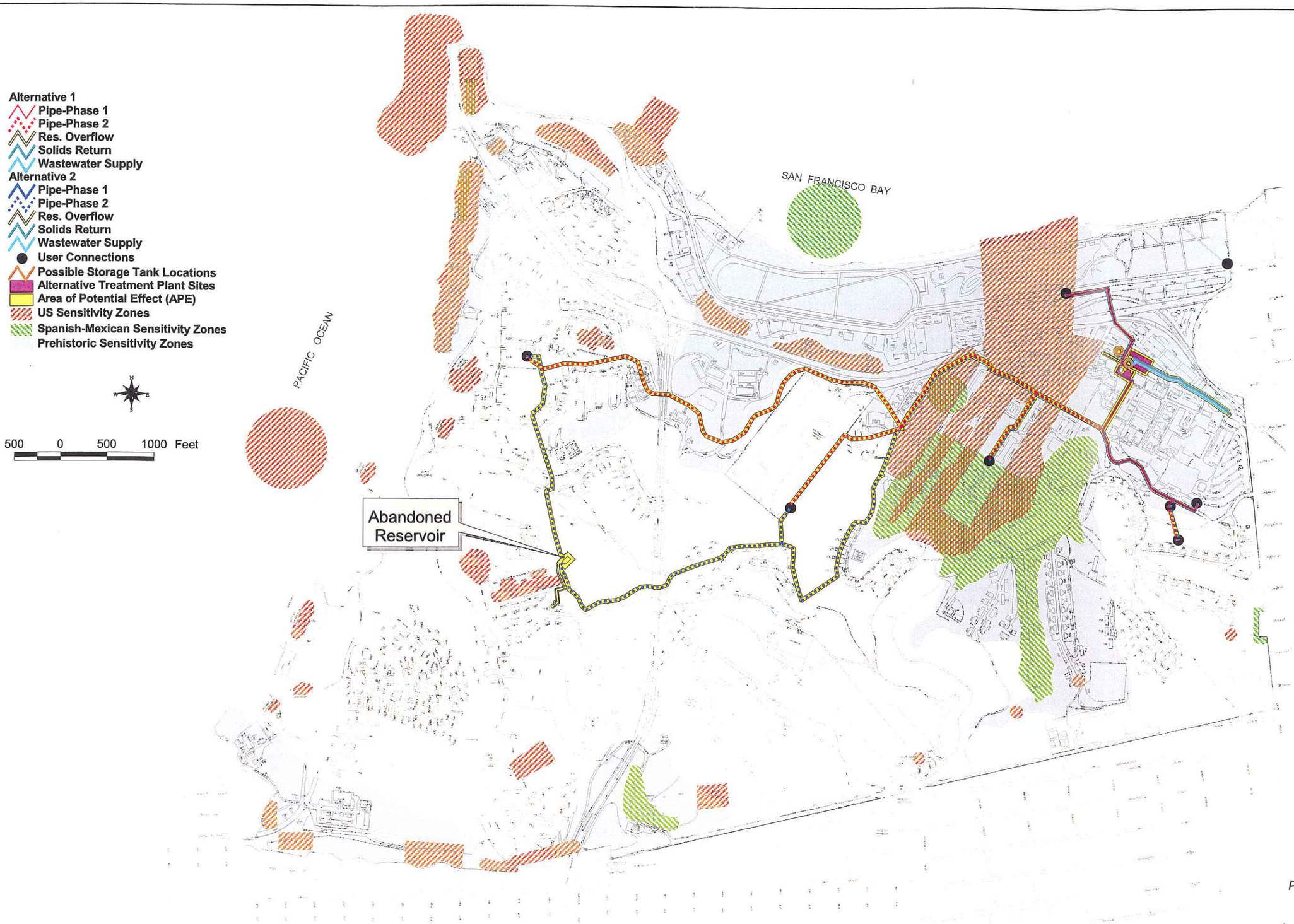
CULTURAL LANDSCAPE

A *cultural landscape* is a "geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or that exhibit other cultural or aesthetic values" (Gilbert and Dolan 1998). The landscape characteristics that contribute to the integrity of a cultural landscape include spatial organization and cluster arrangement, land use, cultural traditions, circulation, topography and drainage, vegetation, buildings and structures, views and vistas, small-scale features, and archaeological sites. The cultural landscape of the Presidio is significant as part of the National Historic Landmark District status. Various features including mature vegetation and character-defining features of the historic forest adjacent to Lincoln Avenue and Kobbe Avenue and in the vicinity of Building 1469, and cobble retaining walls and steps in the

Presidio Water Recycling Project

Figure 3.5-1
Contributing Buildings to the National Historic Landmark District (NHLD)

SOURCE: Presidio Trust GIS Database



SOURCE: Presidio Trust GIS Database

Presidio Water Recycling Project

Figure 3.5-2

Archeological Sensitivity and Area of Potential Effect

vicinity of Kobbe Avenue and Ruckman Terrace occur within the APE and could be affected by the proposed project (refer to impact analysis below for additional detail).

REGULATORY BACKGROUND

The Presidio is listed as a National Historic Landmark District on the National Register of Historic Places. As such, the proposed project is subject to review under the National Historic Preservation Act (NHPA). Section 106 of the NHPA requires agencies to identify historic properties and assess whether implementation of an undertaking will have an adverse effect on such properties. If adverse effect is determined, then the agency undertakes consultation with the State Office of Historic Preservation, the Advisory Council on Historic Preservation, interested parties, and the public in an attempt to resolve adverse effects. In general, conformity with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Rehabilitating Historic Buildings can avoid an adverse effect. These standards include the retention of historic character, materials, and finishes, repair rather than replacement of deteriorated features, the protection of archaeological resources, and the general preservation of historic integrity. These standards also include guidelines for the treatment of cultural landscapes. These include principles related to the retention of landscape elements, including both tangible and intangible elements of the historic landscape. Compliance with Section 106 at the Presidio of San Francisco, for those projects determined to have no adverse effect, are reviewed pursuant to a programmatic agreement dated March 5, 2002.

The Native American Graves Protection and Repatriation Act (NAGPRA) addresses the rights of lineal descendants, Indian tribes, and Native Hawaiian organizations to Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony. It requires federal agencies and institutions that receive federal funds to provide information about Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony to lineal descendants, Indian tribes, and Native Hawaiian organizations, and upon presentation of a valid request, dispose of or repatriate these objects to them.

3.5.2 ENVIRONMENTAL CONSEQUENCES & MITIGATION

During the planning phase of the project, Historic Preservation Specialists, Cultural Landscape Specialists, and Historical Archaeologists were consulted in order to identify and refine project alternatives and minimize the impact of the project on the Presidio's significant historic resources.

ALTERNATIVE 1 (CENTRALIZED STORAGE), PHASE 1

Effects on Historic Structures

Building 1063 (Preferred Site)

Alterations to this building to accommodate the proposed treatment plant equipment would include the removal of several 6x6 center posts, removal of a portion of the existing floor slab for

the process tank foundation, removal of a portion of the mezzanine, and widening of an existing access door by three feet on the south façade. Seismic improvements would also be required in order to bring the building to current code levels. All alterations to this building would be done in accordance with the Secretary of the Interior's Standards for Rehabilitation. The impact to fabric highly sensitive to alteration would not be significant, and would not result in an adverse effect to the historic building.

Building 1040

In order to accommodate the proposed treatment plant's mechanical requirements, existing equipment would need to be removed. In addition, it would also be necessary to remove several interior walls. An access door on the west façade of the building would be increased to provide access for equipment installation and maintenance. Seismic improvements would also be required in order to bring the building to current code levels. All alterations to this building would be done in accordance with the Secretary of the Interior's Standards for Rehabilitation. In order to avoid significant and adverse effects, interior and exterior features would be further evaluated, and those identified as highly sensitive to alteration would be retained to the maximum extent feasible, as determined during future design-level work.

Building 1062

Modifications to this building for rehabilitation as a treatment plant would include the removal of the non-historic theater installation. Approximately one third of the concrete floor between the first floor and basement would be removed to accommodate process tanks. A 15-foot access door would be installed on the south façade. Seismic improvements would also be required in order to bring the building to current code levels. Alterations to this building would be done in accordance with the Secretary of the Interior's Standards for Rehabilitation. In order to avoid significant impact and adverse effect, interior and exterior features would be evaluated further and those identified as highly sensitive to alteration would be retained to the maximum extent feasible during future design-level work.

> *The rehabilitation and reuse of a historic building for the proposed water recycling plant would be done in accordance with the Secretary of the Interior's Standards and no significant or adverse impact on historic architecture would occur.*

Effects on Archeological Resources

Wastewater Diversion & Solids/Sludge Return Pipeline

As shown on Figure 3.5-2, these project components are located within a prehistoric sensitivity zone (specifically referred to as the P2 Estuary Bluff Predicted Prehistoric Area in the NHL Updated). The area was subject to previous archaeological testing for the Letterman Digital Arts Center project, and no archaeological features were identified. Impacts could occur from a "post-

review discovery", that is, the discovery of a previously unknown archaeological site during construction. Should that occur, the Presidio Trust would follow 36 CFR, Part 800 of the National Historic Preservation Act procedures outlined in the Programmatic Agreement.

Recycled Water Treatment Plant and Recycled Water Pump Station

There would be no known impacts to archaeological features.

Recycled Water Storage Reservoir, Standby Potable Water Service and Pipeline

The proposed locations for the Recycled Water Storage Reservoir and Standby Potable Water Service are within the footprint of a known environmental remediation site (Landfill 6). (Refer to Section 3.6 for a discussion of Hazardous Materials.) No impacts to archaeological features are expected, providing the reservoir excavation does not exceed the footprint of the landfill remediation. The pipeline is within the P2 Estuary Bluff Predicted Prehistoric Area, which has not previously been investigated in its entirety. Historic fill deposits vary in depth throughout the alignment. In some instances the overflow pipeline may be above any soil strata that date to the pre-contact period and no impact would occur. In other areas the pipeline may intrude into strata that potentially could contain prehistoric deposits. These would be handled as a "post review discovery," described above.

Impacts to archaeological features from Alternative 1 Phase 1 are expected to be absent or minimal. All ground-disturbing construction activities will be subject to archaeological monitoring in accordance with the NPS, GGNRA Programmatic Agreement or the Presidio Trust Programmatic Agreement Stipulation XIII and the Presidio Archaeological Monitoring Protocols (which ever is applicable at the time of monitoring). Should significant archaeological features be discovered during construction, the Presidio Trust will act in accordance with Stipulation XIV "Discoveries."

> *Implementation of the proposed pipelines and other ground-disturbing activities under Alternative 1 (Phase 1) would not have a significant or adverse impact on archeological features.*

Effects on Cultural Landscapes

Recycled Water Treatment Plant

Reuse of one of three alternative buildings for the proposed water recycling plant would require building rehabilitation and seismic retrofit. It is possible that some limited exterior work may be needed, such as the installation of seismic footings. However, based on field reconnaissance, exterior work outside the footprint of the buildings, is unlikely to disturb historic fabric associated with the cultural landscape.

Implementation of Alternative 1, Phase 1 would not have a significant or adverse impact on cultural landscapes.

General Effects on NHL District

Signage required for the identification of recycled water use area (per water recycling permit), as well as piping and other equipment that is other than within a structure, may impact the National Historic Landmark. In addition, boxes for electrical equipment that are above ground may impact the National Historic Landmark. The design, scale, and location of signage and any above ground equipment/fixtures would meet the Secretary of the Interior's Standards.

All signage or above ground fixtures would be designed and implemented in accordance with the Secretary of the Interior's Standards, and would not have a significant or adverse impact on the NHL district.

ALTERNATIVE 1 (CENTRALIZED STORAGE), PHASE 2

Effects on Archeological Resources

During Phase 2 of Alternative 1, the recycled water distribution system, the irrigation system connections and site retrofit could adversely effect the following predicted historic and prehistoric archaeological features, as described in the NHL Update:

#	Description	Dates
F18	Laundress and Enlisted Quarters	1866-1890
F20	Stream Ravine Dump Area	1866-1890
P2	Estuary Bluff Prehistoric Area	0000-1776

Mitigation Measure CH-1: The Trust would seek to avoid archaeological features. If avoidance of the American period historic features and prehistoric sites during Phase 2 is deemed infeasible, consultation with the State Historic Preservation Officer in accordance with 36 CFR Part 800 and the provisions of the Presidio Trust Programmatic Agreement would be implemented. Mitigation would include controlled excavation prior to construction, using scientific recording methods and resulting in recovery of any significant cultural materials or information. Archaeological excavations would proceed in accordance with a research design and data recovery plan based on background data, sound planning, and accepted archaeological methods. The data recovery plan would provide for the reporting and dissemination of results, as well as interpretation of what has been learned in a manner that is accessible and understandable to the public. Appropriate arrangements for the permanent curation of archaeological materials and records would be carried out in accordance with federal regulation 36 CFR Part 79. All archaeological work to be carried out would be under the supervision of persons meeting the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738-44739). Mitigation

measures for F-38 and F-44 from the 1993 NHL could be limited to field recordation and collection during construction, along with appropriate levels of documentary research.

Following implementation of Mitigation Measure CH-1, Alternative 1 (Phase 2) would not have a significant or adverse impact on archaeological features.

Effects on Cultural Landscapes

During Phase 2 of Alternative 1, the water distribution system has the potential to affect circulation, vegetation, and small-scale features of the Presidio. Removal of mature vegetation adjacent to Lincoln Avenue and Kobbe Avenue could result in an alteration of character-defining features of the historic forest, and thus all construction in this area should be confined to the existing road prisms. There are many significant features including cobble retaining walls and steps in the vicinity of Kobbe Avenue and Ruckman Terrace. Installation of pipeline in this area could result in the disturbance or removal of historic fabric, and therefore all construction would be confined to the existing road prism.

Mitigation Measure CH-2: Proposed pipeline alignments along Kobbe Avenue, Lincoln Avenue and Ruckman Terrace would be confined to the existing asphalt road prism. Final design of the various project components would be reviewed by a Trust cultural landscape specialist prior to construction to ensure that cultural landscapes are adequately protected. The exact location of the distribution system will be flagged or painted on the corridor route.

With mitigation measure CH-2, this alternative would not have a significant or adverse effect cultural landscapes within the Presidio.

ALTERNATIVE 2 (MULTIPLE STORAGE SITES), PHASE 1

General Historic and Cultural Resource Effects

Phase 1 of Alternative 2 proposes the same project components as Phase 1 of Alternative 1. The same three alternative building sites (for the proposed treatment plant), wastewater diversion pipeline, alternative recycled water storage tanks, and distribution pipelines would be included under Alternative 2, Phase 1. Therefore, the impact on cultural and historic resources would be the same as previously described for Alternative 1, Phase 1 above.

Implementation of Alternative 2, Phase 1 would not have a significant or adverse impact on cultural and historic resources.

ALTERNATIVE 2 (MULTIPLE STORAGE SITES), PHASE 2

Effects on Historic Structures

Building 1469

Only general information related to the type of alterations that might be needed to reuse this existing reservoir are known at this time. As described in Chapter 2, it is assumed that roof repairs, painting, installation of a bug screen, seismic retrofit, telephone/electric service, level controls, and possibly a liner or coating system to provide a water-tight structure would be needed. Because this is a Phase 2 project, additional investigation of the structure would be needed in the future closer to the time of proposed reuse (i.e., in approximately 7 to 10 years). At that time, a detailed study of the reservoir's current condition would be conducted, and specific improvements would be identified. Alterations to this historic feature would be done in accordance with the Secretary of the Interior's Standards for Rehabilitation so that no adverse effect would occur.

> *The proposed rehabilitation and reuse building1469 (abandoned reservoir) would be done in accordance with the Secretary of the Interior's Standards and no significant or adverse impact on historic architecture would occur*

Effects on Archeological Resources

Under Phase 2 of Alternative 2, the proposed recycled water distribution system, irrigation system connections and site retrofit could adversely effect the following predicted historic and prehistoric archaeological features (as described in the NHL Update):

#	Description	Dates
F18	Laundress and Enlisted Quarters	1866-1890
F20	Stream Ravine Dump Area	1866-1890
F38	Fort Winfield Scott Ordnance Storage & Shops	1891-1914
F44	Battery McKinnon-Stotsenberg	1897-

Impacts to archaeological features from Alternative 2, Phase 2 could occur from subsurface ground disturbance required for the installation of water distribution lines and irrigation connections in areas where these do not currently exist.

The proposed alignment would be in close proximity to the predicted locations of F-18 and F-20. The Laundress and Enlisted Quarters (F-18) is under investigation by Caltrans as part of the Doyle Drive Project, and more information will be available prior to the completion of the NEPA process for this project. Impacts to the Stream Ravine Dump Area (F-20), if any, are expected to be minimal due to the thickness of modern fill deposits and the shallow depth of the construction disturbance (less than six feet). The alignment also coincides with predicted features from F-38

Fort Winfield Scott Ordnance Storage & Shops and F-44 Battery McKinnon-Stotsenberg, which may incur minor disturbance. According to the 1993 NHL update, the contributive value of historic archaeological sites is believed to diminish somewhat after 1890, and by 1917 there is insufficient data or disciplinary research to suggest that archaeological remains would contribute substantially to the landmark (p. 8-15).

Mitigation Measure CH-1 would apply to Alternative 2 also.

Following implementation of Mitigation Measure CH-1, Alternative 2 (Phase 2) would not have a significant or adverse impact on archeological features.

Effects on Cultural Landscapes

Reuse of the existing abandoned reservoir during Phase 2 of Alternative 2 could adversely effect the cultural landscape by altering circulation patterns (trails) and removing vegetation within the historic forest. The vegetation within the fence is not historic; but the access pipeline, which would be required to connect to the reservoir, is routed through historic forest. This area of the historic forest is in poor health and was already identified for replanting under the adopted *Presidio Vegetation Management* Plan (NPS and Trust, 2001). No significant impact would occur as a result of this alternative (refer to Section 3.4 for additional discussion of the biological impacts).

Installation of the recycled water distribution system during Phase 2 (Alternative 2) also has the potential to adversely affect the cultural landscape by altering or removing historic fabric, including circulation systems including sidewalks and steps, vegetation and historic plant materials, and small-scale features, such as river rock and cobble drainage systems. Historic fabric includes sidewalks and steps throughout the distribution route. There are several features including cobble and river rock drains and gutters in the vicinity of the proposed alignment at Infantry Terrace that may be affected. Installation of pipeline in this area could result in the removal or disturbance of these features, and thus all pipeline construction would be confined to the existing roadway to avoid impacts to the landmark district status. The pipeline alignment between Infantry Terrace and Washington Boulevard goes through an area of historic forest. Removal of mature vegetation could result in an alteration of character-defining features of the historic forest, and thus all construction in this area should be confined to the existing utility corridor (where trees were previously removed). The proposed pipeline between the existing Compton Road and Hitchcock Street would also occur within an area of historic forest (primarily eucalyptus). Construction activities in this location would likely require the removal of individual trees. This area of historic forest has been identified for reforestation and rehabilitation in the adopted Presidio Vegetation Management Plan (VMP). Consistent with the VMP, the proposed pipeline construction activities would be coordinated with the reforestation effort and would be done in accordance with the Secretary of Interior's Guidelines for Treatment of Cultural Landscapes.

Mitigation Measure CH-3: The proposed pipeline corridor along Infantry Terrace would be kept within the asphalt road prism in order to avoid important cultural landscape features in this area, which include river rock and cobble drainage systems. The proposed pipeline corridor between Infantry Terrace and Washington Boulevard would also be kept within the existing disturbed utility corridor to avoid disturbing or removing character-defining features of the historic forest. Consistent with mitigation measure CH-2, final design drawings would be reviewed by a Trust cultural landscape specialist prior to construction to ensure cultural landscapes are adequately protected.

With mitigation measure CH-3 and coordination with the adopted VMP reforestation efforts, this alternative would not have a significant or adverse effect on cultural landscapes within the Presidio.

NO ACTION ALTERNATIVE

Under the No Action Alternative, none of the water recycling facilities would be constructed. The existing water distribution system would continue to meet water needs (domestic and irrigation) at the Presidio with potable water, and no physical changes affecting historic resources would occur.

3.6 HAZARDOUS MATERIALS

3.6.1 AFFECTED ENVIRONMENT

The United States, Mexico, and Spain used the Presidio as a military base for 220 years. The United States Army management included the installation of underground storage tanks and pipelines, creation of landfills, and usage of herbicides, fungicides and insecticides that have impacted environmental conditions in the Presidio. Based upon historical documentation and data collected from recent investigations, specific areas within the Presidio have been identified as likely to contain impacted soil and/or groundwater (see Figure 3.6-1). Dumping, equipment maintenance areas, fuel storage and distribution areas, and hazardous material storage areas located throughout the Presidio have resulted in site-specific areas of potential petroleum hydrocarbon, polynuclear aromatic hydrocarbons, solvents, pesticides, heavy metals or cyanide impacts (National Park Service, 1994). Trenching, excavation, and dewatering associated with the proposed project alternatives would traverse through or adjacent to several of these identified impacted areas, as shown on Figure 3.6-1. Some areas within the Letterman Complex area believed to contain surficial fill soils of various ages. Experience with fill soils in other locations of the Presidio indicates these soils occasionally contain building debris or contaminated soils. Recycled water distribution lines for both Alternative 1 and 2 would cross through this area.

A fuel distribution system and associated underground storage tanks were formerly located in the vicinity of the water recycling facility alternatives and subsurface storage sites. The Trust is continuing to investigate soil and groundwater conditions and assess petroleum hydrocarbon impacts that were initially identified by the U.S. Army. Remediation activities in the vicinity of the Letterman Complex will likely include excavation of impacted soil, although shallow groundwater depths (approximately five to 10 feet below ground surface) in this region will likely limit the vertical extent of over-excavation.

Due to considerable age of many Presidio structures, lead-based paint and asbestos are commonly identified in historical buildings. The three proposed locations for the water recycling facility, (Buildings 1040, 1062, and 1063) have been assessed for the presence of asbestos by the Trust. Past asbestos removal (abatement) has occurred; however, friable asbestos remains in all three structures. Building 1469, which houses the remote storage reservoir, is a concrete structure and therefore no asbestos issues exist with this building. In general, structures constructed before December 31, 1978 are at-risk for lead-based paint, and asbestos was commonly used as a building material until 1978. An evaluation to determine the potential presence of lead-based paint has not been conducted on these four structures (Feickert 2001). All four buildings were constructed and subsequently renovated before 1978, and may therefore contain lead-based paint.

REGULATORY SETTING

Definitions

Hazardous Materials

Hazardous materials are substances with certain physical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed. Hazardous materials are grouped into the following four categories, based on their properties: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), and reactive (causes explosions or generates toxic gases).[1] Hazardous materials have been and are commonly used in commercial, agricultural, and industrial applications, as well as in residential areas to a limited extent.

Hazardous Waste

A hazardous waste is any hazardous material that is discarded, abandoned, or is to be recycled. The criteria that render a material hazardous also make a waste hazardous.[2] If improperly handled, hazardous materials and wastes can result in public health hazards if released to the soil or groundwater or through airborne releases in vapors, fumes, or dust.

Worker Safety

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the work place. The California Division of Occupational Safety and Health (Cal OSHA) and the federal Occupational Safety and Health Administration are the agencies responsible for assuring worker safety in the workplace. Cal OSHA assumes primary responsibility for developing and enforcing standards for safe workplaces and work practices (OSHA 1985). These standards would be applicable to both construction and operation.

3.6.2 ENVIRONMENTAL CONSEQUENCES AND MITIGATION

ALTERNATIVE 1 (CENTRALIZED STORAGE)

Possible Exposure to Lead-Based Paint and Asbestos

The proposed structures were constructed prior to 1950, and lead-based paint or asbestos are likely present. Renovation could therefore expose construction workers to hazardous levels of lead-based paint and asbestos. Consistent with relevant OSHA requirements, an environmental site health and safety plan would be prepared prior to any building rehabilitation activities to address worker safety hazards that may arise during renovation.

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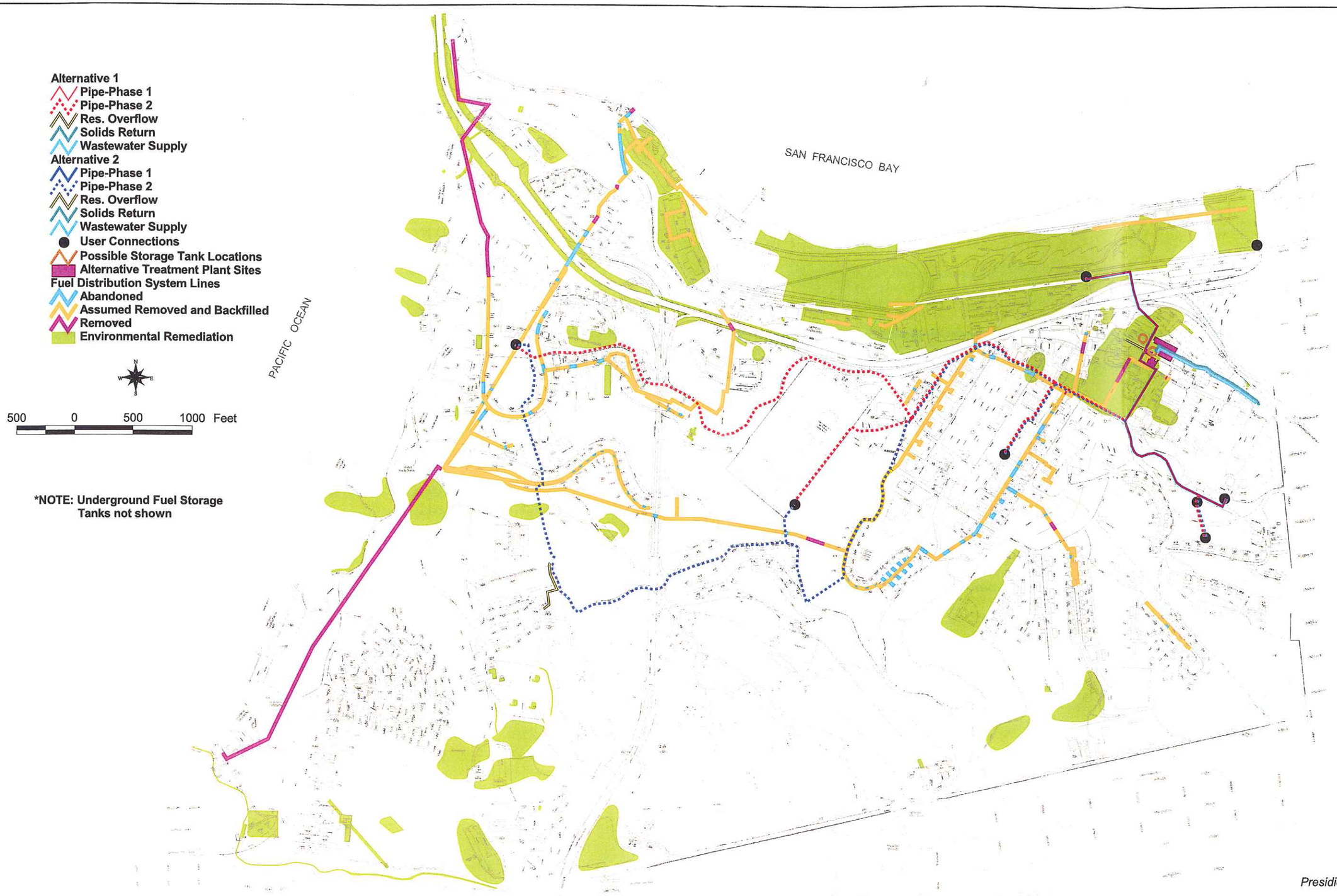
1 Title 22 of the California Code of Regulations, Division 4.5, Chapter 11, Article 3.

2 California Health and Safety Code, Section 25151.



Presidio Water Recycling Project

Figure 3.6-1

Environmental Remediation Sites

SOURCE: Presidio Trust GIS Database

The construction contractor would be required to comply with all applicable OSHA regulations regarding worker safety. Both the federal and Cal OSHA regulate worker exposure during construction that impact lead-based paint. Interim Final Rule found in 29 CFR Part 1926.62 covers construction work where employees may be exposed to lead during such activities as demolitions, removal, surface preparation for re-painting, renovation, clean up and routine maintenance. The OSHA-specified method of compliance includes respiratory protection, protective clothing, housekeeping, hygiene facilities, medical surveillance, and training. No minimum level of lead is specified to activate the provisions of this regulation. Should lead-based paint be detected, a lead-based paint abatement plan would also be prepared and implemented. Elements of the plan shall include the following:

- Containment of all work areas to prohibit off-site migration of paint chip debris.
- Removal of all peeling and stratified lead-based paint on building surfaces and on non-building surfaces to the degree necessary to safely and properly complete demolition activities per the recommendations of the survey. The demolition contractor shall be identified as responsible for properly containing and disposing of intact lead-based paint on all equipment to be cut and/or removed during the demolition.
- Providing on-site air monitoring during all abatement activities and perimeter monitoring to ensure no contamination of work or adjacent areas.
- Cleanup and/or HEPA vacuum paint chips.
- Collection, segregation, and profiling waste for disposal determination.
- Post-demolition testing of soil to assure that soil at the site is not contaminated by lead-based paint.
- Providing for appropriate disposal of all waste.

Asbestos abatement would be conducted prior to renovation of the existing buildings, consistent with existing regulations. All identified asbestos-containing materials would be removed and appropriately disposed of by a state certified asbestos contractor. The renovation or demolition of buildings containing asbestos requires retaining contractors who are licensed to conduct asbestos abatement work and notifying the Bay Area Air Quality Management District (BAAQMD) ten days prior to initiating construction and demolition activities.

The impacts to worker health and safety from exposure to lead-based paint or asbestos from renovation activities would be minimized through compliance with existing safety regulations, and the impact would be less-than significant.

Possible Exposure to Contaminated Soil and Groundwater

Trenching and excavation would occur in areas identified as potentially impacted from dumping, artificial fill, and petroleum hydrocarbons. For example, leakage of materials from former fuel distribution lines southwest of the Main Post may have resulted in impacts to soil along this utility corridor. The Letterman Complex was previously used as a fuel storage and distribution area, and as been identified as likely to contain petroleum hydrocarbon impacted soil and groundwater.

Contaminated soil and groundwater encountered during construction operations would be handled in accordance with standard practices and protocols to ensure worker safety and minimize the chances of releases of contaminants. These standard practices include preparation of site-specific health and safety plans, and handling of petroleum-bearing soils in accordance with state and/or federal regulations.

The Trust would be required to comply with all applicable OSHA regulations regarding worker safety, and relevant clean up activities consistent with the Presidio Contingency Action Plan. The OSHA-specified method of compliance would be dependent upon the severity of impact to soil and groundwater. Appropriate measures may include eye protection and specific handling requirements.

The impacts to worker health and safety from exposure to impacted soil during trenching and excavation would be minimized through compliance with existing safety and remediation regulations, and the impact would be less-than significant.

Possible Exposure to Hydrocarbon Impacted Groundwater

Groundwater elevations at the site of the proposed underground storage tanks are approximately five to 10 feet below grade (San Francisco County Transportation Authority 2001). The proposed project would involve excavation to approximately 30 feet below grade for the installation of recycled water storage tanks, and would likely require dewatering. Past site operations have included storage and distribution of petroleum products, and the extent of groundwater impact has not been fully assessed.

Dewatering associated with tank installation would discharge extracted groundwater into the sanitary sewer system under the Trust's existing Industrial Discharge Permit (IDP). Sampling of extracted groundwater would occur prior to discharge to assure compliance with constituent limits set forth in the Trust's IDP, and the Trust would comply with all applicable regulatory agency requirements set forth by the City of San Francisco, Department of Public Works, regarding disposal of groundwater generated by site dewatering.

Potential environmental impacts associated with disposal of hydrocarbon impacted groundwater from construction dewatering would be less-than significant.

Use of Hazardous Materials During Construction

Construction would involve the use of certain hazardous materials such as fuels, oils, paint, solvents and glues. Inadvertent release of large quantities of these materials into the environmental could adversely impact soil, surface waters, or groundwater quality. However, the on-site storage and/or use of large quantities of materials capable of impacting soil and groundwater are not typically necessary for a project of the proposed size and type. Implementation of measures as part of the project's BMP-6 (see Section 2.3) for handling of hazardous materials during construction would minimize the potential adverse effects to groundwater and soils.

Impacts associated with handling and use of hazardous materials during construction would be less-than significant.

Use of Hazardous Materials During Plant Operation

The treatment technology at the proposed water recycling facility would rely on ultra-violet light for disinfection, thereby minimizing the volume and type of chemicals used and stored at the facility. However, operation of the wastewater reclamation facility would include the storage and use of sodium hypochlorite, which is considered a "strong oxidizer." Sodium hypochlorite, commonly known as household bleach, would be used as a cleaning solution for membrane maintenance, odor control, and as a residual disinfectant. A thirty-day supply of bleach would be stored on-site at any given time. Monthly deliveries of bleach would be made by truck. Daily use would range from 4 to 10 gallons per day for Phase 1 and Phase 2, respectively. The transportation of sodium hypochlorite would be governed by U.S. Department of Transportation regulations, while the storage and handling would be governed by Cal OSHA regulations.

Impacts associated with handling and use of hazardous materials during future operation of the water recycling plant would be less-than significant.

ALTERNATIVE 2 (MULTIPLE STORAGE SITES)

General Hazardous Materials Effects

Potential hazardous materials impacts, mitigation measures, and significance levels associated with Implementation of Alternative 2 would be the similar to those associated with Alternative 1.

Alternative 2 would have no significant impacts regarding hazardous materials, with implementation of mitigation measures identified under Alternative 1.

ALTERNATIVE 3 (NO ACTION)

General Hazardous Materials Effects

Under the No Action alternative none of the water recycling facilities would be constructed or operated. The remediation activities described above (e.g., lead and asbestos removal) would be implemented as part of future projects to rehabilitate and reuse affected buildings.

The No Action Alternative would have no significant impacts associated with hazardous materials.

3.7 TRAFFIC

3.7.1 INTRODUCTION

The focus of this analysis is on the construction-related effects of the proposed project. Once operational, the project (under Alternatives 1 and 2) would have a minimal impact on existing traffic and transportation patterns. A maximum of two employees would be needed to operate the plant, and delivery of materials to and from the plant would be infrequent (approximately twice per month).

EXISTING ROADWAY NETWORK

The Presidio of San Francisco is located in the northwest corner of San Francisco, with roadways connecting to the Marina and Cow Hollow neighborhoods to the east and the Richmond, Sea Cliff and Presidio Heights neighborhoods to the south. All of the intersections within the Presidio, as well as those connecting the Presidio with the rest of the City (with the exception of the Marina Gate), are unsignalized with either two-way or all-way stop control (the Marina Gate is partially signalized). The key roadways within the project study area are described below.

Lincoln Boulevard runs generally east-west in the eastern portion of the Presidio and north-south in its western portion, and serves as the primary thoroughfare in the Presidio. It begins at the intersection of Presidio Boulevard/Letterman Drive and ends at the intersection of 25th Avenue/ El Camino del Mar. Lincoln Boulevard contains two lanes each way between Torney Avenue and Keyes Street, and one lane each way west to El Camino del Mar.

Presidio Boulevard contains one lane each way, and begins at Funston Avenue in the Main Post Planning District, connects to Lincoln Boulevard/Letterman Drive near the Letterman Planning District, and continues north-south in the eastern portion to the southern boundary where it becomes Presidio Avenue in San Francisco.

Lombard Street runs east-west from its intersection with Presidio Boulevard near the Letterman Planning District, and extends into San Francisco to the east. Lombard Street has one lane each way. It serves as the primary gateway to the eastern portion of the Presidio.

Washington Boulevard is primarily a residential street with one lane each way. It runs east-west from its intersection with Lincoln Boulevard at the western edge of the Presidio, and extends eastward to Arguello Boulevard.

Gorgas Avenue provides east-west access on the northeast side of the Presidio. It connects with U.S. Highway 101 and Lyon Street at an eastern gateway, and provides access to Crissy Field via Halleck and Marshall Streets at its western terminus. Gorgas Avenue is mostly a two-lane roadway, except east of General Kennedy Avenue, where it contains two eastbound lanes and one westbound lane.

Halleck Street is a two-lane collector street that provides north-south access within the Presidio between Mason Street and Lincoln Boulevard. To the north, Halleck Street becomes Mason Street after its intersection with Old Mason Street. To the south, Halleck Street terminates at the T-intersection at Lincoln Boulevard.

EXISTING TRAFFIC CHARACTERISTICS

Weekday traffic volumes in the Presidio are primarily work-related, so they do not vary significantly by season, unlike weekend traffic, which is primarily recreational. Counts taken in 1998 indicate that weekday traffic volumes were between 63,000 and 67,000 throughout the year, while weekend traffic ranged from 58,000 in the fall to 75,000 in the summer. According to origin/destination survey data collected in 1996, the Presidio's seven major entrances (not including 15th Avenue and Gorgas Avenue) carry significant pass-through traffic (Peccia 1996). The study indicated that Lombard Street and Presidio Boulevard have the highest pass-through percentages, with the majority of their pass-through traffic moving between these two gateways. The Lincoln Boulevard entrance (at 25th Avenue and El Camino del Mar) had the next highest pass-through percentages, with most of its through trips either entering or leaving at the Merchant Road and Golden Gate Viewing Plaza entrances. The data show that these roadways are primary pass-through routes to the bridge. All of the intersections internal to the Presidio currently operate acceptably during both a.m. and p.m. peak hours.

BICYCLE AND PEDESTRIAN CIRCULATION

The Presidio does not have a continuous system of sidewalks, bicycle trails and bicycle lanes. Sidewalks and marked pedestrian crossings are provided sporadically throughout the Presidio. In many cases within the Presidio, pedestrians and bicyclists must mix with vehicles on the street system to move from one area to another. Sidewalks within the Presidio are generally provided in areas that are currently well-occupied, such as the western portion of the Letterman Planning District and along Lincoln Boulevard in the Main Post. Most intersections within the Main Post and along Lincoln Boulevard have marked pedestrian crossings.

PARKING

There are a total of approximately 7,790 parking spaces within Area B, with about 1,979 (25 percent) of these spaces occupied during the midday period (Draft PTIP EIS 2001). Parking facilities within each of the Presidio planning districts are between 17 percent and 30 percent occupied, indicating that there is currently substantial available parking in all planning districts.

TRANSIT

Public transit systems serving the Presidio include the San Francisco Municipal Railway (MUNI) and the Golden Gate Bridge, Highway and Transportation District (Golden Gate Transit or GGT). These services provide access to other regional carriers such as BART, AC Transit, Caltrain,

SamTrans, and the regional ferry system. In addition, there are private transit carriers that accommodate specific needs not served by the public systems.

Presidio Shuttle

This free shuttle serves the entire Presidio, operates 7 days a week, and has frequent stops in all seven planning districts within the park. Clean fuel buses connect residential area commercial areas, and visitor destinations within the park, as well as key transfer points to MUNI and Golden Gate Transit buses.

Tour Buses and Charter Services

On a typical summer weekday, 180 tour buses carry visitors to and from Presidio attractions such as the Golden Gate Bridge Plaza, Fort Point, and the Visitor Center on the Main Post. The Golden Gate Bridge is the primary attraction. They also stop at several scenic overlooks along the 49-mile drive (Peccia 1999). During the spring and fall seasons, about 210 and 220 tour buses enter the Presidio on a typical weekday.

3.7.2 ENVIRONMENTAL CONSEQUENCES & MITIGATION

ALTERNATIVE 1 (CENTRALIZED STORAGE)

Temporary Effects on Circulation

Construction of each phase of Alternative 1 would have an estimated 20 construction employees, and would take roughly 12 months to complete. This would result in a generation of 20 a.m. and 20 p.m. peak-hour vehicular trips. The addition of 20 peak-hour trips to the Presidio's street network would be considered nominal, and would not affect the current intersection levels of service, or have a noticeable impact on parking supplies. Normally, no material deliveries or other heavy traffic (i.e., hauling of materials) would occur during the a.m. and p.m. peak hours. The existing capacities of the transit service providers in the Presidio would not be noticeably affected by the construction of Alternative 1.

The construction of Alternative 1 may affect the current circulation patterns of vehicles, transit service providers, pedestrians and bicyclists, because several of the proposed pipeline segments would occur within existing roadways (see Figure 2-4). Trenching and other construction-related activities would cause intermittent and temporary delays and closures of specific segments the following roads:

Phase 1

- Gorgas Avenue
- Edie Road
- Letterman Drive
- Old Mason Street
- Girard Road

Phase 2

- Marshall Street
- Keyes Avenue
- Sheridan Avenue
- Lincoln Boulevard (Funston Avenue to Presidio Boulevard)
- Ruckman Avenue
- Storey Avenue
- Fisher Loop
- Taylor Road
- Lombard Street

Pipeline construction would proceed at roughly 150 to 200 feet per day. During these activities, portions of roadway would be closed, and flag crews would be used to ensure safe passage through the remaining open lanes of travel. This would result in a one-way lane closure for a maximum duration of 5 to 15 days on any given road. In addition, implementation of the Construction Traffic Management Plan (CTMP) as part of the project's BMP-5 (see Section 2.3) for traffic and transportation would alleviate potential congestion and delays; potential hazards for motorist, pedestrians and bicyclists; and potential inconveniences to transit providers to a level of insignificance.

Construction-related traffic impacts would be less-than significant, and no additional mitigation is recommended or required.

ALTERNATIVE 2 (MULTIPLE STORAGE SITES)

Temporary Effects on Circulation

Similar to Alternative 1, each construction phase of Alternative 2 would have an estimated maximum of 20 construction employees, and each phase would require roughly 12 months to complete. The addition of 20 peak hour trips to the Presidio's street network would be considered nominal, and would not affect the current (acceptable) intersection levels of service.

Also, the existing capacities of the transit service providers in the Presidio would not be noticeably affected by the construction of Alternative 2. Since the primary difference of Alternative 2 relates to the locations of the proposed storage and distribution facilities, construction effects related to this alternative's treatment plant sites would be essentially the same as described above. The difference with this alternative would be the result of potential impacts to segments of the following roadways, with particular locations towards the south of the main complex areas of the Presidio (see Figure 2-5 for the specific locations of the facilities for Alternative 2):

Phase 1

- Gorgas Avenue
- Edie Road
- Letterman Drive
- Old Mason Street
- Girard Road

Phase 2

- Marshall Street
- Keyes Avenue
- Sheridan Avenue
- Lincoln Boulevard (from 300 ft southeast of Girard Road to Presidio Boulevard)
- Ruckman Avenue
- Washington Boulevard
- Upton Avenue
- Taylor Road
- Lombard Street
- Montgomery Street
- Moraga Avenue
- Infantry Terrace
- Amatury Loop
- Kobbe Avenue

During pipeline construction, portions of roadway would be closed, and flag crews would be used to ensure safe passage through the remaining open lanes of travel. Implementation of the CTMP as part of the project's BMP-5 (Section 2.3) for traffic and transportation would alleviate potential congestion and delays; potential hazards for motorist, pedestrians and bicyclists; and potential inconveniences to transit providers to a level of insignificance.

Construction-related traffic impacts would be less-than significant, and no additional mitigation is recommended or required.

ALTERNATIVE 3 (NO ACTION)

Under the No Action alternative, none of the proposed water recycling components would be constructed and there would therefore be no construction-related traffic impacts as discussed above.

3.8 AIR QUALITY AND ODORS

3.8.1 AFFECTED ENVIRONMENT

AMBIENT AIR QUALITY STANDARDS

The federal Clean Air Act Amendments of 1970 established national ambient air quality standards, and individual states retained the option to adopt more stringent standards and to include other pollutants. California had already established its own air quality standards when federal standards were established, and because of the unique meteorological conditions and associated air quality problems in the state, there is considerable diversity between state and federal standards currently in effect in California.

The ambient air quality standards incorporate a margin of safety and are designed to protect those segments of the public most susceptible to respiratory distress, known as sensitive receptors, such as asthmatics, the very young, the elderly, people weak from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels somewhat above the ambient air quality standards before adverse health effects are observed.

AIR QUALITY MONITORING DATA

Federal, state, and local agencies operate a network of monitoring stations throughout California to provide data on ambient concentrations of air pollutants. Recent monitoring data from monitoring stations in San Francisco indicate occasional exceedances of state standard for PM_{10}. All other criteria air quality standards have not been exceeded in San Francisco over the past five years.

AIR QUALITY PLANS

The federal Clean Air Act requires nonattainment and maintenance areas to prepare air quality plans that include strategies for attaining and maintaining the national standards. The state California Clean Air Act also requires plans for nonattainment areas. Thus, just as areas in California have two sets of designations, many – including the Bay Area – also have two sets of air quality plans: one to meet federal requirements relative to the national standards and another to meet state requirements relative to the state standards.

State Implementation Plan

Regional air quality plans developed under the federal Clean Air Act are included in an overall program referred to as State Implementation Plans (SIPs). Plans have been prepared for the Bay Area to address nonattainment and maintenance issues related to the national (one-hour) ozone standard and the national carbon monoxide standard.

A new Bay Area ozone SIP, the *Ozone Attainment Plan* (Association of Bay Area Governments 1999), has recently been approved by U.S. EPA. This 2001 Ozone Attainment Plan replaces the previous Bay Area ozone SIP (i.e., the *Ozone Maintenance Plan*) in conjunction with the approved portions of the 1999 Plan.

The *Carbon Monoxide Maintenance Plan* (Association of Bay Area Governments 1994) was developed to ensure continued attainment of the national carbon monoxide standard in the Bay Area.

Clean Air Plan

The Bay Area Air Quality Management District (2000) developed the *Bay Area 2000 Clean Air Plan* to meet planning requirements under the state California Clean Air Act. This plan was developed to address the nonattainment designation of the Bay Area with respect to the state ozone standard.

CONFORMITY WITH ADOPTED AIR QUALITY PLANS

U.S. EPA also has developed criteria and procedures for determining the conformity of federal actions to the applicable SIPs. The General Conformity Rule is used to assess conformity with an applicable SIP. Section 93.158 (a)(5)(v) of the 1990 amendments to the Clean Air Act (the General Conformity Rule) states that an action will be considered to conform to the applicable SIP if "a federal action involves regional water and/or wastewater projects, such projects are sized to meet only the needs of the population projections that are in the applicable SIP." The rule defines a regional water and/or wastewater project as one that affects a large portion of a nonattainment or maintenance area. Because of the relatively small scale of the proposed project and because there would be no operational emissions of criteria air pollutants, the proposed project would have emissions below the "de minimus" threshold, and therefore would be presumed to be in conformance with the General Conformity Rule, as it relates to wastewater treatment plants (Lo 2002).

OTHER REGULATORY REQUIREMENTS

California Air Resources Board (CARB), the State's air quality management agency, is responsible for establishing and reviewing the state ambient air quality standards, compiling the California SIP and securing approval of that plan from U.S. EPA. CARB also oversees the activities of air quality management districts, which are organized at the county or regional level. As a general matter, U.S. EPA and CARB regulate emissions from mobile sources, and the air districts regulate emissions from stationary sources associated with industrial and commercial facilities.

In the Bay Area, the Bay Area Air Quality Management District (BAAQMD) is the regional agency empowered to regulate air pollutant emissions from stationary sources. BAAQMD regulates air quality through its permit authority over most types of stationary emission sources and through its planning and review activities. Even though the proposed project is located on

federal land, stationary sources of air pollution proposed by the project would be subject to the permit authority of the BAAQMD.

The BAAQMD also monitors odors through its Regulation 7, which requires the District to take certain enforcement actions after receiving 10 or more complainants over a 90 day period. Once review under Regulation 7 is initiated, the BAAQMD would collect air samples and determine the dilution threshold necessary to render the odor to an undetectable level. If the measured dilution rate exceeds a 4:1 ratio at the property line or the standard for the given height of the emission source, then the operator must reduce odor emissions to below the threshold.

SENSITIVE RECEPTORS

Some land uses are considered more sensitive than others to odors and air pollution. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions source, or duration of exposure to air pollutants. Schools, hospitals and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are also sensitive to poor air quality.

Treatment Facilities

Sensitive receptors within the vicinity of the proposed treatment facilities and new storage reservoirs consist of residential dwellings in Building 1029, approximately 300 feet west of the project site, and residential dwellings on Lyon Street and the Marina, which are one-quarter mile to the east. Additionally, Crissy Field is a recreation area located approximately 1,000 feet north of the subject site, and can be considered as a sensitive use.

Pipeline Construction

Sensitive receptors within the vicinity of the pipeline construction consist of those identified for the treatment facilities and, in particular, residential dwellings along Lyon Street, which are approximately 200 feet from the Gorgas Gate discharge point. Other receptors include residential uses along Sibert Loop (west of Arguello Boulevard) and Sumner Street (west of Presidio Boulevard). The Alternative 1 alignment would pass by a residential area along Ruckman Avenue. The Alternative 2 pipeline alignment would pass by the Hitchcock Street residential area and a residential area along Amatury Loop (east of Park Boulevard).

3.8.2 ENVIRONMENTAL CONSEQUENCES AND MITIGATION

ALTERNATIVE 1 (CENTRALIZED STORAGE)

Construction Emissions

Construction of the project would generate fugitive dust (including PM_{10}) and other criteria air pollutants from exhaust emissions. A large portion of the total construction dust emissions would

result from trenching and excavation (for underground storage tank) activities. Dust emissions would vary from day to day, depending on the phase of construction, the silt content of the soil, and the weather. Daily emissions would depend greatly upon whether construction of the various project components (e.g., excavation of underground storage tank and associated pipelines) would occur simultaneously.

BAAQMD considers carbon monoxide and ozone precursor emissions as part of its emissions inventory and as such are not expected to impede attainment or maintenance of ozone and carbon monoxide standards in the Bay Area. For this reason, emissions of carbon monoxide (CO), ROG and NO_X from construction equipment are not typically quantified, and are considered a less-than-significant impact.

In regards to PM_{10} emissions, BAAQMD indicates that if control measures are implemented, then PM_{10} emissions from construction activities would be considered a less-than significant impact. The dust control measures identified in Section 2.3 (BMP-2: Dust Control) are considered to be part of the project and, as such, would serve to reduce dust emissions. Because these measures include those identified by the BAAQMD, project-related construction dust emissions are considered to be less-than significant.

Construction-related emissions of ROG, NOx, CO and PM_{10} would be less-than significant, and no mitigation is recommended or required.

Operational Emissions

The BAAQMD has established thresholds for assessment of project impacts on air quality that are commonly employed in determining the significance of potential air quality impacts and these thresholds are used for this analysis. For operational impacts, emissions of 80 pounds per day of reactive organic gases, nitrogen oxides, and particulate matter are considered significant. Sensitive receptors (facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effect of air pollution) are evaluated by their proximity to potential sources of air pollution.

Proposed pumps and blower equipment would be electrically powered, and would not generate on-site emissions. Because no solids treatment is proposed for the project, there would be no flaring of digester waste gas or sludge heating required. Back-up diesel generators are not proposed as part of the project. Because no sources of criteria air pollutants would be generated by the project, the potential operational effects on air quality would be considered less-than significant.

Operation-related emissions of ROG, NOx, CO and PM-10 would be less-than significant, and no mitigation is recommended or required.

Odors

Although there is a potential for odor generation wherever wastewater is handled, the proposed water recycling facility would not be expected to generate substantial odors for several reasons, as summarized below.

- All wastewater associated with the project would be generated at the Presidio and would involve a short transit time in the local sewer system, thereby minimizing the potential for the development of anaerobic conditions (which can create odors).

- Based on a raw wastewater sampling conducted for the proposed project, wastewater at the Presidio can be characterized as a weak domestic wastewater with no sulfides detected, which further reduces the potential for odor generation (as compared to strong wastewater, which is common in municipal systems).

- There would be no solids handling at the proposed recycled water facility (solids handling and treatment can be a major source of odor generation).

- The proposed project would entail a multiple barrier approach (redundancy) to odor control, whereby the headspace of the screening and process units would be vented to an odor control device, and, in addition, the entire building interior would be ventilated through another odor control device. These odor control devices would consist of a series of biofilter scrubbers to control odors from the facility.

- Odors are perceived based on their concentrations. The proposed facility would be located in an area with strong westerly prevailing winds, and in the unlikely event of upset conditions or equipment malfunction, these conditions would provide for a rapid dissipation of any potential odors that escape the plant.

The BAAQMD identifies a two step process for determining potential odor impacts. The first step is to determine whether the project is located within a given screening distance of a sensitive receptor; for conventional wastewater treatment plants, this screening distance is one mile. [Because the proposed treatment building locations are within 300 feet of dwelling units in Building 1029 and 1,300 feet of residences on Lyon Street, they are within the BAAQMD screening distance.] The second step for analysis of odor impacts from a new facility is to assess the extent of odor complaints from existing similar facilities. The Enforcement Division of the BAAQMD was contacted to review the potential for odor complaints from similarly-sized facilities using similar technology. BAAQMD is not aware of any plants that use the same technology as that proposed by the project (Boemher 2001). Most of the plants under BAAQMD purview are large municipal plants that handle sludge (e.g., San Francisco, Pacifica, Daly City, and San Mateo), and as such are not directly comparable to the proposed project, which would be a relatively small plant with no solids handling facilities. Although no comparable water recycling facilities exist in the Bay Area, similar facilities are operating elsewhere (with no odor problems), as described below.

Existing plants that use the treatment technology proposed are currently operating in Anthem, Arizona, Arapahoe County, Colorado and Viejas, California. The Anthem, Arizona plant has been in operation for three years, and currently has a throughput of 0.4 MGD, which recycles wastewater from a mix of residential and commercial sources from the Del Webb residential/golf course development. An on-site scrubber abates odors from the treatment process and the headworks. The nearest residence to the plant is located approximately one-quarter mile away. The plant currently has no history of odor complaints (Moore, 2001). A review of air quality complaints for the community showed no history of odor complaints (www.maricopa.gov).

The Arapahoe County, Colorado plant has been in operation for three and a half years, and currently has a throughput of 1.1 MGD from a mix of residential and commercial sources; the plant currently has no odor control equipment. The plant has no history of odor complaints (Stigmiller 2002). The nearest residence to the plant is located approximately one-quarter mile away.

The Viejas plant is operated for an Indian casino on Indian lands, over which the San Diego Air Quality Management District has no enforcement jurisdiction. Consequently, the operator of the Viejas Plant was contacted to establish if the facility has any odor complaint history. The plant operator stated that the plant has been in operation since May 2000 and currently has a throughput of 0.125 MGD of commercial wastewater from the Indian casino. An on-site scrubber abates odors from the treatment process, while the open basin headworks is treated with magnesium hydroxide. The plant has no history of odor complaints (the closest residence is approximately 0.5 mile from the plant) (Fromath 2001).

Available data indicate that treatment facilities of the size and technology proposed for the Presidio have not resulted in nuisance odor emissions. As with any wastewater treatment process, there is a potential for short-term odor emissions, particularly during upset or maintenance conditions. However, as discussed in the Affected Environment Section, the BAAQMD regulates odor emission, including wastewater treatment plants, under its Regulation 7, and the BAAQMD has established a mechanism to respond to odor emissions should they become objectionable to the community at large (1-800-334-ODOR[6367]). Given that the raw wastewater at the park is weak, would have a short residence time in the local sewers, that the proposed facility would be of modern, state-of-the-art design and construction that would not handle solids, and that similar plants have no history of nuisance odors, the potential impact from odor emissions is considered to be less-than significant.

Operation-related odor emissions would be less-than significant, and no additional mitigation is recommended or required.

ALTERNATIVE 2 (MULTIPLE STORAGE SITES)

General Air Quality and Odor Effects

Since the primary difference under this alternative relates to storage and distribution facilities, operational effects related to the alternative treatment plant sites would be the same as described above. Alternative 2 would include more construction activities from rehabilitation of the existing storage reservoir and installation of approximately 10 percent (in length) more pipeline. This would result in a slight increase in air pollutant emissions. However, these impacts are expected to be less-than significant, with implementation of mitigation measures under Alternative 1.

> *Alternative 2 would have no significant impacts on air quality and odor, with implementation of mitigation measures under Alternative 1.*

ALTERNATIVE 3 (NO ACTION)

General Air Quality and Odor Effects

Under the No Action alternative, there would be no construction-related dust impacts as discussed above. Because wastewater would not be treated on-site, there would also be no impacts regarding pollutant or odor emissions associated with the No Action alternative.

> *The No Action Alternative would not generate air quality or odor emission impacts, and no mitigation is recommended or required.*

3.9 NOISE

3.9.1 AFFECTED ENVIRONMENT

NOISE TERMINOLOGY

Sound levels are the audible intensities of air pressure vibrations, and are most often measured with the logarithmic decibel (dB) scale. To consider the human response to the pitch and loudness of a given sound in the context of environmental noise, the A-weighted frequency-dependent scale (dBA) is usually employed. The equivalent energy indicator, L_{eq}, is an average of noise over a stated time period, usually one-hour. The day-night average, L_{dn}, is a 24-hour average, which accounts for the greater sensitivity of most people to nighttime noise. Generally, a 3 dB difference at any time is noticeable to most people and a difference of 10 dB is perceived as a doubling of loudness.

NOISE-SENSITIVE USES

Certain types of land uses are considered to be more sensitive to ambient noise levels than others, due to the amount of noise exposure (in terms of both exposure time and intensity) and the types of activities typically involved with these land uses. Schools, libraries, churches, hospitals, convalescent and nursing homes, auditoriums, parks, and outdoor recreation areas are generally more sensitive to noise than are commercial and industrial land uses. Residences may also be considered noise-sensitive uses because residents may be disturbed by noise.

Land uses within the vicinity of the project study area include recreational, residential, office and open space uses. Sensitive receptors within the vicinity of the proposed treatment facility and subsurface storage reservoir consist of residential dwellings in Building 1029, approximately 300 feet west of the project site, and residential dwellings on Lyon Street and the Marina, which are one quarter mile to the east. Additionally, Crissy Field is a recreation area located approximately 1,000 feet north of the subject site, and can be considered as a sensitive use.

Sensitive receptors within the vicinity of the pipeline construction consist of those identified for the treatment facilities and, in particular, residential dwellings along Lyon Street, which are approximately 200 feet from the Gorgas Gate diversion point. Other receptors include residential uses along Sibert Loop (west of Arguello Boulevard) and Sumner Street (west of Presidio Boulevard). The Alternative 1 alignment would pass by a residential area along Ruckman Avenue, while the Alternative 2 pipeline alignment would pass by the Hitchcock Street residential area and a residential area along Amatury Loop (east of Park Boulevard).

EXISTING NOISE ENVIRONMENT

The area of analysis for potential noise impacts includes adjacent and off-site areas that could be affected by project-generated construction and operational noise. The existing noise environment in these areas is influenced primarily by surface-vehicle traffic, principally on Doyle Drive /

Highway 101, Richardson Avenue, Park Presidio Boulevard, Lombard Street and Presidio Boulevard.

Long-term 24-hour noise measurements were collected at Building 1029 and at the corner of Marina Boulevard and Lyon Street, which are residential areas. The noise environment of these areas is primarily effected by surface traffic on Doyle Drive and Marina Boulevard, respectively. The average daytime (7:00 a.m. to 10:00 p.m.) noise level at Building 1029 was recorded to be 60 dBA, while the average nighttime noise level was recorded to be 54 dBA and the Ldn was 62 dBA. For Lyon Street, the average daytime (7:00 a.m. to 10:00 p.m.) noise level was recorded to be 73 dBA, while the average nighttime noise level was recorded to be 67 dBA and the Ldn was 75 dBA.

NOISE REGULATIONS, PLANS, AND POLICIES

Local noise control for the urban neighborhoods surrounding the Presidio is governed by the San Francisco Noise Ordinance (Article 29 of the San Francisco Police Code, 1994). Section 2909 of the Code restricts noise levels generated by fixed noise sources, such as industrial or commercial loading operations. This section states that it is unlawful for any person to operate any fixed machinery or equipment, or similar mechanical device, in any manner so as to create any noise that would cause the noise level measured at the property line of the affected property to exceed the standards for a given zoning designation, as described below.

Residences along Lyon and Richardson Street and the rest of the Marina District are located in a RH-1 (low density residential) zoning district. The Palace of Fine Arts is designated in City Zoning maps as being located in a P (public) zoning district. The City generally adopts the standard of the adjacent land use for applying the ordinance standards to a given P district.

Application of the noise ordinance to the project site results in a fixed-source property line noise limit of 55 and 50 dBA at the eastern side of Lyon Street (including the Palace of Fine Arts) during daytime and nighttime hours, respectively. It should be noted that monitored noise levels at these locations are well above the fixed source standards, primarily due to vehicle traffic.

The noise ordinance also regulates construction noise and unnecessary, excessive, or offensive noise disturbances within the City. The construction noise regulations in Sections 2907 and 2908 of the San Francisco Police Code provide that:

- Construction noise is limited to 80 dBA at 100 feet from the equipment during daytime hours (7 a.m. to 8 p.m.). Impact tools are exempt, provided that they are equipped with intake and exhaust mufflers.

- Nighttime construction (8 p.m. to 7 a.m.) that would increase ambient noise levels by five dBA or more is prohibited, unless a permit is granted by the Director of Public Works.

3.9.2 ENVIRONMENTAL CONSEQUENCES & MITIGATION

ALTERNATIVE 1 (CENTRALIZED STORAGE)

Construction Noise Effects

Construction noise levels at and near locations on the treatment facility site and along pipeline alignments would fluctuate depending on the particular type, number, and duration of use of various types of construction equipment. The effect of construction noise would depend upon the type of construction activity, the distance between construction activities and the nearest noise-sensitive uses, and the existing noise levels at those uses.

Table 3.9-1 shows typical noise levels generated by different types of standard construction equipment. The proposed treatment facility would be located in an existing building, and most construction-related activity would be associated with building rehabilitation, which would occur inside the building. The building structure would serve as a noise barrier and help to reduce off-site noise impacts. However, nearby excavation would be necessary, first to remediate existing hazardous materials in this area, followed by construction of the proposed underground storage reservoir (Option A or B). Excavation activities would involve the use of an excavator shovel, which as shown in Table 3.9-1 would generate approximately 82 dBA at 50 feet. The receptors nearest the proposed storage reservoirs would be Building 1029, which is approximately 150 feet away from the nearest reservoir location. Noise at the nearest residences could be expected to be approximately 75 dBA during periods when excavation activities are nearest receptors. These predicted noise levels would not exceed the standards of the San Francisco Noise Ordinance, which allows for non-impact construction equipment to operate at 80 dBA or less at a distance of 100 feet between the hours of 7:00 a.m. and 8:00 p.m.

Trenching for pipelines would generally involve the use of a backhoe, which as shown in Table 3.9-1 would generate approximately 80 dBA at 50 feet. The receptors nearest the proposed Alternative 1 pipeline alignments would be residences on Lyon Street, within 200 feet of the easternmost segments, residences on Ruckman Avenue and residences at Building 1029, within 100 feet of trenching segments. The duration of trench excavation activities is expected to be relatively short-term in nature, as pipeline excavation typically occurs at a rate of approximately 150 to 200 feet per day. Consequently, noise levels would slowly increase over approximately two days at a given receptor, peak, and then recede for approximately two days, resulting in an impact period of less than one week.

Trenching construction noise during the noisiest phases of construction would be 80 dBA at 50 feet. Noise at the nearest residences could be expected to be approximately 74 dBA during periods when excavation activities are nearest receptors. These predicted noise levels would not exceed the standards of the San Francisco Noise Ordinance, which allows for non-impact construction equipment to operate at 80 dBA or less at a distance of 100 feet between the hours of 7:00 a.m. and 8:00 p.m.

TABLE 3.9-1
TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Noise Level at 50 feet (dBA, Leq)
backhoes	80
shovel	82
dozers	85
scrapers	89
truck	88
paver	89
pumps	76
generators	81
compressors /a/	81
jack hammers	88
pile drivers	101

SOURCES: *Transit Noise and Vibration Impact Assessment*, Federal Transit Administration, April 1995.
/a/ U.S. Environmental Protection Agency, *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*, December 1971.

Temporary construction-related noise would be more noticeable during nighttime (since background noise is lower); however, implementation of the noise control measures identified in Section 2.3 (BMP-3: Noise Control) prohibit construction activity between 8:00 p.m. and 7:00 a.m. Project-related construction noise is considered to be less-than significant.

Construction-related noise impacts would be less-than significant, with implementation of BMP-3.

Operational Noise Effects

Operation of noise-generating equipment at the proposed treatment plant would include air blowers/odor control mechanisms within the building (which are proposed to be fitted with noise attenuation devices), and pumps that would be located within the treatment facility, at the proposed underground storage reservoir, and at the raw wastewater diversion structure. Specifically, a 50 hp pump would be located at the treatment plant, and a 50 hp submersible pump would be needed at the diversion structure. Pumps proposed for the reservoir would consist of a 100 hp pump at Phase 1 and an additional 200 hp pump at Phase 2.

A 50-horsepower pump generates a noise level of approximately 63 dBA at a distance of 50 feet. Assuming a distance of 100 feet to the nearest sensitive receptors, noise from one 50 hp pump

would be reduced to 57 dBA at a distance of 100 feet. However, the proposed pump is submersible, and would be located below grade. The amount of attenuation afforded by the subsurface location of the pump depends on many factors, including the type of soil, the depth below grade, the size of any opening to the surface. A conservative estimate would be to assume a noise reduction of at least 20 dBA, which can be easily achieved with a modern residential structure with closed windows. Accounting for this attenuation, pump noise from the diversion site would be 34 dBA at a distance of 200 feet (the nearest residence), which would comply with the City's nighttime stationary source standard of 50 dBA. Existing nighttime noise levels at Lyon Street are 67 dBA, and noise from the pump at Gorgas Gate would not be detectable at nearby residences.

The noise environment of Building 1029 would be impacted by operation of both the 50 hp pump at the facility and the two reservoir pumps. A 150-horsepower pump generates a noise level of approximately 76 dBA at a distance of 50 feet. Assuming a distance of 100 feet to the nearest sensitive receptors and accounting for the shielding effects of the building and below-grade location of the submersible pumps, noise from two 150 hp pumps and one 50 hp pump would be conservatively estimated at 53 dBA. This noise level would exceed the standards of the San Francisco Noise Ordinance, which restricts fixed source noise impinging on a residential land use to 50 dBA during the night. However, the ambient nighttime noise level in the vicinity of Building 1029 is approximately 54 dBA, which also exceeds allowable standards and is due to surface traffic on Doyle Drive. Thus, considering that the existing ambient noise level exceeds the applicable standards, and considering that noise attenuation from the submersible pumps would likely be greater than the 20 dBA conservatively estimated, the potential noise impact would be less-than significant. However, however, implementation of the noise control measures identified in Section 2.3 (BMP-3: Noise Control) would require that noise reduction be considered in the project design and construction, such that plant operations would conform to the legal requirements of the San Francisco Noise Ordinance.

Operation-related noise impacts would be less-than significant with implementation of BMP-3.

ALTERNATIVE 2 (MULTIPLE STORAGE SITES)

General Noise Effects

Since the primary difference under this alternative relates to storage and distribution facilities, operational effects related to the alternative treatment plant sites would be similar to those described above. The only difference with this alternative in terms of noise impacts would be the result of construction activities that would impact the Hitchcock Street residential area and a residential area along Amatury Loop instead of Ruckman Avenue residences. However, as described under Alternative 1, these impacts are not expected to result in a substantial noise impact to the environment.

Alternative 2 would have no significant noise impacts, with implementation of BMP-3.

ALTERNATIVE 3 (NO ACTION)

General Noise Effects

Under the No Action alternative, there would be no construction related noise impacts as discussed above. Because no recycled water would be produced on-site, there would be no operational noise emissions associated with the No Action alternative.

The No Action Alternative would not generate noise impacts, and no mitigation is recommended or required.

3.10 GEOLOGY, SOILS, SEISMICITY

3.10.1 AFFECTED ENVIRONMENT

GEOLOGIC AND SEISMIC SETTING

Geologically, marine sedimentary and volcanic rocks that form the Franciscan Assemblage underlie the Presidio.[1] Outcrops of shale, greenstone, sandstone, and serpentine can be found along the northern coastal bluffs between Battery Crosby and the Golden Gate Bridge. Covering the Franciscan Formation over a large central portion of the Presidio are much younger sand dune deposits. Older sand dune deposits and alluvium (slope wash debris, ravine fill, and landslide debris) including the Colma Formation, an unconsolidated fine to medium grained sand, underlie the southeastern portion of the Presidio. Intertidal deposits, recent beach sand deposits, and artificial fill underlie the area along the San Francisco Bay shoreline, including Crissy Field.

Soils located in the Presidio, as classified by the Natural Resource Conservation Service (NRCS) include the *Urban land-Sidrak complex, Orthents, and Argiustolls*. *Urban land-Sidrak* soils occur on stabilized sand dunes and are composed primarily of material derived from sand dunes. *Orthents* soils are derived primarily from sandstone and occur as cut and fill on alluvial fans, coastal terraces, and hills. Due to the characteristics of underlying materials, portions of the Presidio are prone to geologic hazards such as sheet erosion, rilling, soil creep, gullying, stream downcutting, streambank erosion, and landsliding caused by erodable soils and rock.[2]

The San Francisco Bay Area is considered seismically active, and earthquakes are an unavoidable geologic hazard at the Presidio. The closest active faults to the Presidio are the San Andreas fault located approximately four miles west, and the Hayward fault located approximately 12 miles east. Other active regional faults include the San Gregorio-Hosgri fault, located about 18 miles southwest, and the Rodgers Creek fault, located about 24 miles northeast (Jennings 1994); please refer to Figure 3.10-1 for the locations of these faults. Ground shaking from a seismic event on any of these active faults could cause significant damage in the Presidio, and would have the potential to trigger earthquake-induced landslides or cause liquefaction.

As shown in Figure 3.10-2, portions of the Presidio are located with a Seismic Hazard Zone for landslides and liquefaction, as designated by the California Division of Mines and Geology.[3] Areas susceptible to liquefaction are characterized by saturated, cohesionless, granular soils, while landsliding can occur on slopes made unstable by seismic ground shaking, water saturation, oversteepening, excavation at the base of the toe, or slope creep.

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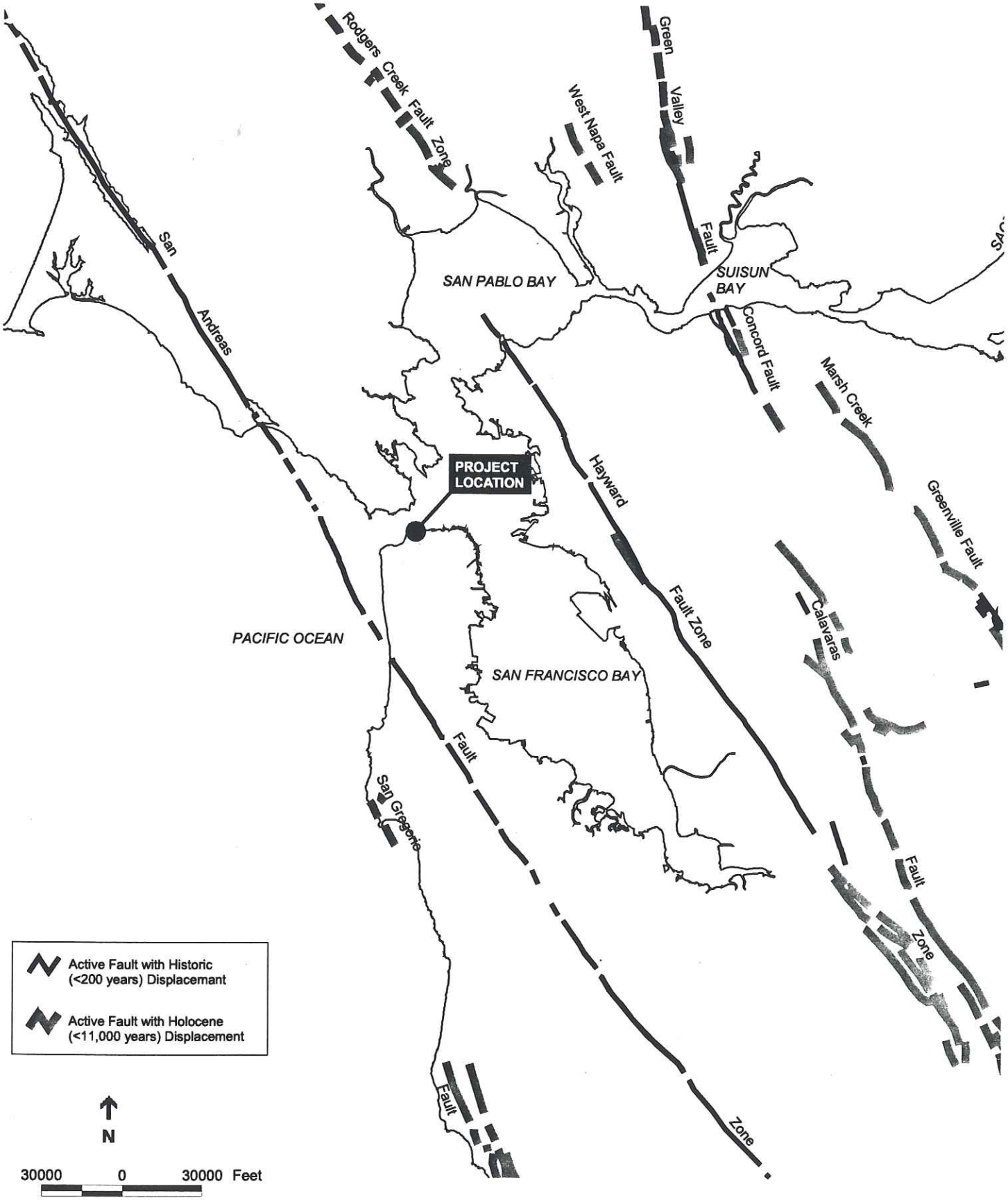
1 The Franciscan Assemblage is the name applied to the rocks that form the bulk of the Coast Ranges. These rocks were first closely studied around San Francisco, hence the name.

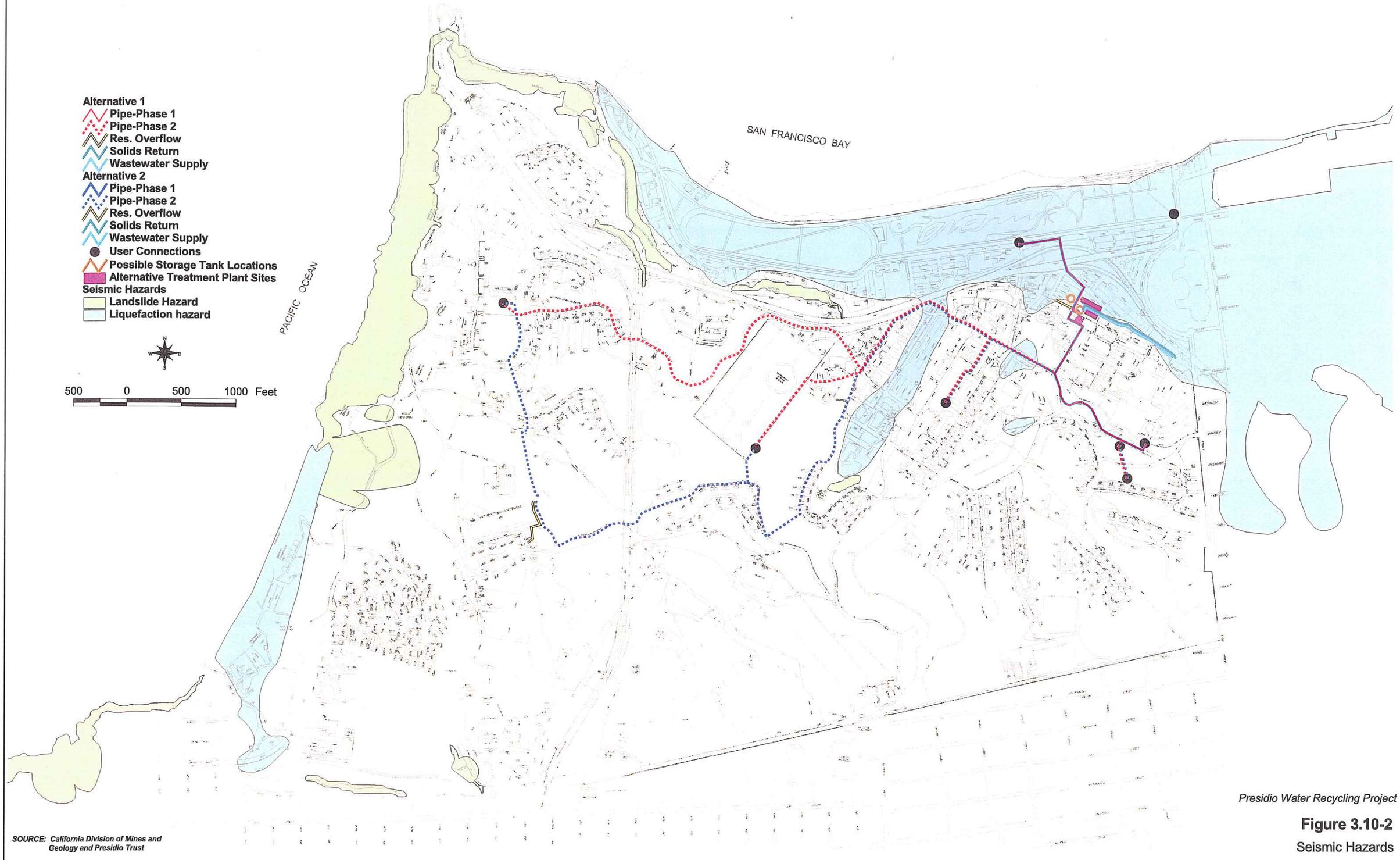
2 *Rill erosion or "rilling"* refers to the development of numerous minute, closely spaced channels resulting from the uneven removal of surface soil by running water that is concentrated in streamlets of sufficient volume and velocity to generate cutting power. Rilling is the intermediate process between sheet erosion and gully erosion. *Scour* refers to the powerful and concentrated clearing and digging action of flowing water.

3 Liquefaction is a phenomenon whereby unconsolidated and/or near saturated soils lose cohesion and are converted to a fluid state as a result of severe vibratory motion.



SOURCE: California Department of Conservation, Division of Mines and Geology (After Jennings, 1994)

Figure 3.10-1
Principal Active Faults in the San Francisco Bay Area



Presidio Water Recycling Project

Figure 3.10-2

Seismic Hazards

SOURCE: California Division of Mines and Geology and Presidio Trust

REGULATORY BACKGROUND

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site must be conducted, and appropriate mitigation measures incorporated into the project design. The *Guidelines for Evaluating and Mitigating Seismic Hazards in California,* California Division of Mines and Geology (CDMG) Special Publication 117, constitutes the guidelines for evaluating seismic hazards other surface fault rupture, and for recommending mitigation as required by Public resources Code Section 2695(a).

3.10.2 ENVIRONMENTAL CONSEQUENCES AND MITIGATION

ALTERNATIVE 1 (CENTRALIZED STORAGE)

Seismic Hazards

The San Francisco Bay Area region contains both active and potentially active faults, and is considered a region of high seismic activity.[4] The U.S. Geological Survey (USGS) Working Group on California Earthquake Probabilities has evaluated the probability of one or more earthquakes of Richter magnitude 6.7 or higher occurring in the San Francisco Bay Area within the next 30 years. The result of the evaluation indicated a 70 percent probability that such an earthquake event will occur in the Bay Area between 2000 and 2030 (USGS 1999). Earthquakes are an unavoidable geologic hazard at the Presidio. The intensity of a seismic event would depend on the causative fault and the distance to the epicenter, the moment magnitude, and the duration of ground shaking. For instance, a large earthquake (magnitude 7 or greater) on the San Francisco peninsula segment of the San Andreas fault could generate higher intensity groundshaking at the Presidio than a similarly large earthquake on a more distant fault such as the Hayward fault or the San Gregorio fault. The nature of underlying geologic materials would also affect the level of groundshaking at the Presidio because areas underlain by artificial fills, inter-tidal deposits, or unconsolidated alluvium can amplify seismic waves, while bedrock areas tend to attenuate ground shaking effects.

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[4] An active fault is defined by the State of California as a fault that has experienced surface displacement within Holocene time (approximately the last 10,000 years). A potentially active fault is defined as a fault that has shown evidence of surface displacement during the Quaternary period (last 1.6 million years), unless direct geologic evidence demonstrates inactivity for all of the Holocene or longer. This definition does not, of course, mean that faults lacking evidence of surface displacement are necessarily inactive. "Sufficiently active" is also used to describe a fault if there is some evidence that Holocene displacement occurred on one or more of its segments or branches (Hart 1997).

Ground shaking during an earthquake can cause damage to structures and induce landslides. Ground shaking at the Presidio could be very intense, considering the relatively short distance to the San Andreas and Hayward faults. Portions of the Presidio are located within a newly designated CDMG Seismic Hazard Zone for liquefaction. These zones include areas underlain by artificial fill and intertidal deposits, located along the San Francisco Bay shoreline near Crissy Field. The Seismic Hazards Map for San Francisco also shows an area of potential liquefaction hazard extending from Lobos Creek to the northern end of Baker Beach. (CDMG 2000).

Pipelines

The majority of the pipeline route proposed under Alternative 1 would be placed in alluvial deposits consisting primarily of dune sand. These deposits include younger, less-consolidated dune sand, found in the central and western portions of the Presidio and the older, more consolidated Colma Formation that underlies the Presidio's eastern portion. Segments of the pipeline route in the extreme northeast portion of the project area (former Letterman complex) would intersect artificial fill and intertidal deposits that tend to have less strength, can amplify ground shaking, and are susceptible to liquefaction.

Typically, damage incurred by buried pipelines during an earthquake is minimal compared to potential damage to above-ground facilities. Excessive ground shaking could weaken pipeline welds or laterally displace segments (leading to isolated leaks), but complete rupture is less likely to occur. Damage leading to leakage in a pipeline system can result in temporary service disruption until the damage is identified and repaired. Pipeline segments placed in areas underlain by unconsolidated artificial fill or intertidal deposits would be subjected to a greater level of ground shaking, and therefore could incur more damage than segments placed in consolidated alluvium. This is especially the case in areas where liquefaction causes material surrounding the pipeline to fail. Although a greater number of pipeline failures are possible in liquefaction-prone areas, the damage would be localized and if leaks do occur, they would represent a temporary service disruption until the pipeline segment is repaired or replaced.

Recycled Water Facilities

Alternative 1 proposes construction of a 500,000-gallon reservoir, a treatment facility, pump support structures and other associated above-ground facilities. These facilities would be placed in the northeastern portion of the Presidio, an area partially underlain by intertidal deposits and artificial fill materials. The artificial fill was placed many years ago and consists of primarily dune sand, but includes unconsolidated and semi-consolidated silt, clay, rock debris, and organic waste. In some areas, especially towards the Bay margin, buried structures exist that include ship timbers and other man-made debris. Artificial fill materials are generally less consolidated than native geologic deposits such as dune sand and alluvium associated with the Colma formation.

These unconsolidated, heterogeneous geologic materials could result in strong seismic ground shaking and subsequent damage to the proposed water recycling facility structures. Furthermore, the shallow groundwater and the composition of the materials are susceptible to liquefaction and

associated ground failures (i.e. seismically induced settlement) when subjected to strong seismic shaking. Displacement due to lateral seismic forces or settlement could be more than some structures can tolerate. Damage from strong seismic shaking is typically more severe in older, unreinforced structures and sometimes can lead to their collapse.

In a seismic event, damage to proposed above-ground structures could include ruptured pipelines connections, toppled equipment, cracked concrete, and foundation failure due to settlement. Facility personnel could be injured from equipment upset, isolated flooding, or fallen structural elements. Most of the significant damage incurred during an earthquake would likely cause temporary service disruptions, rendering the facilities inoperable while the damaged components are repaired.

Earthquake ground motions generated on nearby active faults will cause strong ground shaking at the Presidio. Prior to construction of the proposed pipelines, storage and treatment facilities, a geotechnical investigation will be conducted to evaluate potential geologic and seismic hazards and develop recommendations to reduce the potential for structural failure or collapse during an earthquake. Evaluation and mitigation of earthquake-related risks would be evaluated as required by the Seismic Hazard Mapping Act incorporating the *Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117* as required by the California Division of Mines and Geology. A certified engineering geologist and a registered geotechnical engineer (to evaluate geologic subgrade, earthquake ground motion, and liquefaction), as well as a registered structural engineer (to evaluate structural safety) would generate engineering recommendations needed to reduce seismic risk to acceptable levels.

> *Compliance with standard engineering recommendations and practices, and compliance with the Seismic Hazard Mapping Act, would ensure that the potential adverse impacts from seismic ground shaking would be less-than significant.*

Differential Settlement and Erosion

Differential settlement could occur in areas of the proposed treatment facilities, considering the presence of artificial fill and inter-tidal deposits. Differential settlement could damage building foundations, affect underground utilities, and cause settlement in streets and roads. Settlement could be reduced or eliminated in areas that currently support buildings, because the soils have been allowed to settle over time. Settlement would be a concern in areas that have not previously supported structures and where new structures would place loads heavier than the soils could tolerate.

Soil erosion hazards could occur during preliminary stages of construction, especially during trenching, stripping and recompaction of artificial fill, initial site grading, and prior to resurfacing of street and sidewalk installation.

Prior to construction of the proposed pipelines, storage and treatment facilities, a geotechnical investigation will be conducted to evaluate potential geologic hazards and develop mitigation to reduce the potential for settlement, excessive erosion, and soil loss. A certified engineering geologist, a registered geotechnical engineer, and registered structural engineer would prepare engineering recommendations. The pipeline systems and facilities that are proposed under Alternative 1 would be designed to incorporate currently accepted and standard engineering practices and techniques. These facilities would also include BMPs for erosion control (see Section 2.3, BMP-1: Erosion/Runoff Control). The above measures would reduce potential adverse settlement and erosion impacts to less-than significant levels.

Compliance with standard engineering recommendations and practices would ensure that the potential adverse impacts from differential settlement and erosion would be less-than significant.

ALTERNATIVE 2 (MULTIPLE STORAGE SITES)

General Geologic Effects

Impacts under Alternative 2 would be generally the same as described for Alternative 1. Both alternatives share similar potential impacts related to seismic ground shaking, settlement, and soil erosion. The notable difference between the two alternatives is the 100,000-gallon storage reservoir rehabilitation; however, this does not alter the impact analysis because the reservoir would be rehabilitated to accepted engineering design standards and seismically retrofitted to current earthquake design criteria. Furthermore, the tank is not founded on liquefiable soils or substrate susceptible to settlement.

Alternative 2 would have no significant impacts on geologic, soil, and seismic safety, with implementation of mitigation identified under Alternative 1.

ALTERNATIVE 3 (NO ACTION)

General Geologic Effects

Under the No Action Alternative, no new pipeline, treatment plant, or other facilities, associated with the use of recycled water would be implemented. Therefore, all geologic, soil, and seismic safety impacts affiliated with this project would be avoided.

The No Action Alternative would not generate geologic, soil, and seismic safety impacts impacts, and no mitigation is recommended or required.

3.11 CUMULATIVE EFFECTS

3.11.1 INTRODUCTION

A cumulative impact is the combined effect of past, present or reasonably foreseeable future actions on a particular resource. To assess the cumulative effects of the proposed water recycling project, other relevant actions (which can include projects, programs and/or plans) are first identified. Collectively, these relevant actions are referred to as the "cumulative context." The project-specific impacts of the proposed water recycling system are analyzed within the cumulative context so that a full understanding of the potential cumulative impact on each resource is identified. Cumulative impacts can be individually minor but collectively significant actions occurring over time (40 CFR Section 1508.7). A brief discussion including the status and agency responsible for each of the relevant projects/plans is presented below, followed by an analysis of cumulative effects by environmental area.

- The ***Final Presidio General Management Plan*** **(GMPA)** was approved by the National Park Service in 1994. The GMPA, as amended, is the currently adopted land use plan for the Presidio. The GMPA establishes a framework for the transition of the former military base into a national park and includes concepts for the rehabilitation/reuse of existing historic buildings, building demolition and replacement construction, natural habitat restoration plans, open space expansion and a variety of other actions that would revitalize and increase the visitation and use at the park. The Presidio Trust Act was passed by the United States Congress in 1996, two years after the GMPA was adopted. The Trust Act established the Presidio Trust to manage the non-coastal areas of the Presidio (Area B). The Presidio Trust is in the process of updating the GMPA for Area B through the proposed ***Draft Presidio Trust Implementation Plan*** **(PTIP)**. The Draft Plan and Draft EIS were released for public review and comment in July 2001. A Final Plan and Final EIS are currently being prepared. Once NEPA review is completed and a preferred plan alternative is adopted by the Trust, that plan will serve as the long-term land use plan for Area B. Area A (the coastal areas of the Presidio) remain under the management of the National Park Service and subsequently the GMPA. These two plans broadly set the cumulative context for the park and addressed wherever relevant in the cumulative impact analysis below. A list of the specific projects which could contribute cumulatively to the effects of the proposed water recycling project is presented below.

- **Doyle Drive/Highway 101** delineates the northern boundary of the Letterman Complex, and bisects the Letterman and Crissy Field planning districts. Various seismic retrofit and redesign alternatives for this elevated six-lane highway structure are currently being studied by the San Francisco County Transportation Authority, Caltrans, and the Federal Highway Administration (FHWA) (lead agencies), in consultation with the Trust and NPS. Among the alternatives being considered is retrofit and widen in place, and various combinations of tunnels and elevated structures. All of the alternatives would introduce some type of new direct surface roadway connection (i.e., via a tunnel opening or off-ramp) within the Letterman Complex. These connections would generally occur within and around the Gorgas Avenue corridor in the northern part of the Complex, and based on preliminary engineering,

the majority of the alternatives would require multiple historic buildings to be removed (to accommodate expanded roadways/intersections).

- The **Tennessee Hollow Restoration** study area extends from the East Housing planning district, straddles the western edge of the Letterman Complex and eastern edge of the Main Post, and ends at Crissy Field. Planning for this project was recently initiated by the Trust, and draft restoration alternatives should be available in mid-2002. Although detailed information on the possible alternatives is not available at this time, it is reasonable to assume that some type of enhancement of the natural environment, including possible removal of fill material in this area is likely. Once complete, the restored creek corridor would connect to the **Crissy Marsh** in north. The Trust, NPS and Golden Gate National Parks Association are also currently evaluating opportunities to ensure the long-term health of Crissy Marsh, potentially by expanding the marsh. Detailed information on the location and type of expansion, and its potential environmental effects, are not yet available.

- The **Letterman Digital Arts Center (LDAC)**, is a 23-acre campus located in the eastern portion of the Letterman Complex. The LDAC project was previously reviewed under a separate NEPA document. Once complete, the LDAC will replace the former Letterman Hospital, Research Institute, and associated surface parking lot with a mixed office/ research use campus, public park space (Great Lawn) and public-serving uses, and an underground parking structure. The EIS for the 23-acre Letterman Digital Arts Center included a mitigation measure to improve access to the site, including a slip ramp from northbound Richardson Avenue that will terminate at the intersection of Marshall Street and Gorgas Avenue and a new intersection on Richardson Avenue at Lyon Street. The Presidio Trust is designing and constructing the project in consultation with Caltrans and the City and County of San Francisco. The six-month construction period is expected to begin in the summer of 2002. Construction activities related to this project could occur simultaneously with the proposed water recycling project.

- **Environmental remediation** of hazardous materials/waste sites at the Presidio is an ongoing process that may include a variety of physical actions, including excavation of materials, construction of caps (engineered covers), and monitoring of groundwater or surface water resources. Based on existing information regarding the presence of hazardous materials/waste, remedial activities are expected to occur within the project area at Letterman Complex, and along several of the proposed distribution pipelines.

- Implementation of the **1999 Bay Area Regional Water Recycling Program (BARWRP)** and the **City and County of San Francisco's Recycled Water Master Plan (RWMP)** would increase the amount of recycled water produced (and decrease the amount of secondary treated wastewater entering receiving waters) within the San Francisco Bay Area and San Francisco peninsula. The 1999 BARWRP identifies development of approximately 125,000 acre-feet (or over 40 billion gallons) per year of recycled water within the Bay Area over the next 10 years, and the environmental review process for the BARWRP has not yet been completed. The City's RWMP is considered part of Phase 1 of the BARWRP, and is currently being updated. The RWMP was originally prepared in 1996 and identified a project

capable of producing over 10 million gallons per day of recycled water for use in San Francisco. A Final EIR for the RWMP was certified in 1997; however, the City never adopted the RWMP. At this time the City is in the process of revising the plan to provide for a smaller, less costly project (CCSF 2001). Based on the 1997 Final EIR, there would be no significant adverse effects to groundwater quality, assuming that the project were operated in accordance with all applicable requirements, and that the landscape irrigation and fertilization practices were modified to account for the recycled water quality (CCSF 1997).

3.11.2 LAND USE

Implementation of either action alternative evaluated in this EA would result in the rehabilitation and reuse of an existing industrial building in the Letterman Complex (for the proposed water recycling facility), and associated underground facilities. As described in Section 3.2, the plant would be designed so that noise and odors are adequately contained, and no land use conflicts would occur. The use of recycled water at various locations throughout the park would not alter or otherwise affect current or future land uses, and implementation of either action alternative would be consistent with and carry out a long-time vision for sustainable water resources management at the park.

Land uses within the Letterman Complex have, and will continue to transition as currently vacant historic buildings are rehabilitated and reused, and the LDAC will be completed. Future uses will be required to conform to the adopted land use plan (either Final GMPA, or once complete the Final PTIP) as well as the *Letterman Complex Planning & Design Guidelines* (Trust 2000), which will help ensure that the historic character, scale and spatial organization of the Complex are preserved. The possible exception would be the implementation of the Doyle Drive/Highway 101 retrofit project, currently under study. This project will be subject to its own environmental review process, and detailed information on the project's effects are not currently known, and would vary depending upon the alternative selected. Based on the preliminary range of alternatives, it appears that a new surface roadway connection to Highway 101 could be introduced within the Letterman Complex, and multiple historic buildings could be removed, including Building 1063 under one of the current Doyle Drive alternatives. Ongoing coordination with the Doyle Drive/Highway 101 lead agencies will focus on use of land for the right-of-way and engineering a roadway project that minimizes conflicts with existing and planned land uses.

3.11.3 WATER RESOURCES

Cumulatively, the demand for water at the Presidio would increase over time under both the adopted Final GMPA and the proposed PTIP. The demand for irrigation water (i.e., recycled water) would be relatively consistent under either land use plan, and both of the action alternatives evaluated in this EA would have a beneficial effect by providing a new source of drought-resistant, non-potable water at the park that would result in reduced demand for potable water in the future. The reduction in potable water demands that would occur over the life of the proposed project would be a beneficial effect, despite overall increases due to the levels of employment and population in the park.

Implementation of the 1999 BARWRP or the CCSF's RWMP would expand the regional use of recycled water, but no significant cumulative effects would be expected; rather, the cumulative effects would be considered beneficial as less treated wastewater would be discharged to the Bay, and less potable water would be consumed. Considering on-going remediation efforts, beneficial effects on local groundwater quality are expected. Other development activities within the Presidio, including the LDAC, Doyle Drive, and environmental restoration projects would not result in significant cumulative effects from the proposed water recycling project.

3.11.4 BIOLOGICAL RESOURCES

Individually, either of the proposed action alternatives would not have a significant impact on biological resources. The proposed project facilities were specifically located to avoid or minimize impacts to biological resources. All biologically sensitive areas would be avoided or otherwise sufficiently protected to minimize the impact of construction activities. Some short-term disturbance of common wildlife and plant species would result from project construction; however, various best management practices and mitigation measures would be implemented to minimize this impact. Operationally, recycled water would meet or exceed the highest level of relevant state quality standards and would be used for irrigation in landscaped areas only.

As a result of the proposed project, the Presidio may be required to remove an undetermined number of mature "historic forest" eucalyptus trees to accommodate the proposed pipeline. Project development may require removal of one or more, and perhaps up to several dozen, mature eucalyptus trees, which would be mitigated to a less-than significant level in the current project. Cumulatively, other proposed projects may also result in the loss of individual trees throughout the Presidio; however, factors such as tree disease and age already require the continued maintenance and replacement of historic forest trees. Because removed trees will be replaced as per an established tree replacement schedule, the implementation of multiple development projects in the Presidio will not contribute to overall loss of historic forest trees. The loss of historical forest trees is considered a less-than significant cumulative project effect.

Based on the overall low wildlife habitat values in the proposed project corridor and minimal effects of the current proposed action, no cumulative effects are expected to special status plant or wildlife species. Cumulatively, the proposed project would not improve or degrade habitat for these species.

When viewed in the context of the BARWRP and other regional water quality projects, the proposed project is not expected to cumulatively affect plants or wildlife in the Presidio or aquatic habitats of San Francisco Bay.

Cumulatively, there are a variety of programs and projects that could have both beneficial and adverse effects on biological resources at the park. These projects/programs are in varying stages of development and implementation, and include activities being managed by outside agencies. Because other proposed projects in the Presidio such as Doyle Drive/Highway 101, LDAC, and ongoing environmental remediation will occur in areas that are either already developed or have relatively few biological resource values, the current project would not have cumulative effects

on biological resources. The Tennessee Hollow Restoration is expected to result in a net benefit to common plants and wildlife, thus no adverse cumulative effects are expected.

3.11.5 CULTURAL RESOURCES

The project alternatives were designed and subsequently refined through the environmental review process to avoid or minimize the potential impact on cultural resources. Individually, neither of the two action alternatives would have a significant or adverse impact on cultural or historic resources. In complying with the *Secretary of the Interior's Standards for Rehabilitation of Historic Structures* for the use of the Trust's preferred treatment plant site (Building 1063), the historic structure would benefit from rehabilitation and reuse. Avoidance of various resources or known sensitive areas would also minimize potential impacts to the cultural landscape and archaeological features.

Cumulatively, there are a variety of activities that could affect cultural and historic resources within the project area. Recent building rehabilitation within this portion of the Letterman planning area include the Gorgas Avenue Warehouses. Concentrating mainly on the interior of the buildings, these projects were undertaken in compliance with the Section 106 of the National Historic Preservation Act. Rehabilitation work removed intrusive elements that altered the building's interior spatial relationships, thus reintroducing the historic character of the buildings. It also retained character-defining features to the maximum extent possible.

Past projects, including the Rehabilitation of the Thoreau Center, were also undertaken in compliance with Section 106 of the National Historic Preservation Act. Implemented more than five years ago, this project successfully adapted this series of buildings for modern office use, while retaining both interior and exterior character-defining elements.

The LDAC will be constructed in compliance with Section 106 of the National Historic Preservation Act and will follow various guidance set forth in the *Programmatic Agreement Among the Presidio Trust, the Advisory Council on Historic Preservation, the National Park Service, and the California State Historic Preservation Officer regarding deconstruction, new construction, and the execution of associated leases at the Letterman Complex, Presidio of San Francisco, California.*

The Doyle Drive project, depending upon the alternative identified for implementation, could have the potential to remove multiple historic buildings. Prehistoric and historic archaeological sites in the Crissy Field Planning District could also be subject to potential impacts from the Doyle Drive project. In particular, the alternatives with below-ground or tunnel features pose the greatest threat to buried prehistoric and historic archaeological sites. The Federal Highway Administration and Caltrans will be conducting further investigations to identify specific archaeological site boundaries and impacts to archaeological sites from each of the alternatives.

The 23-acre LDAC project is not expected to contribute to cumulative impacts because no evidence of buried archaeological sites was found during a recent investigation, archaeological monitoring will take place during the demolition and new construction phases, and the process

defined in the Programmatic Agreement, Archaeological management Plan, and Discovery Process will be adhered to.

3.11.6 HAZARDOUS MATERIALS

Implementation of either action alternative would not result in a significant impact to hazardous materials. Compliance with standard federal, state, and local rules and regulations, in conjunction with a soil monitoring plan, would reduce potential hazards associated with lead-based paint, asbestos, and impacted soil and groundwater to a less-than significant level. Past, present, and reasonably foreseeable future actions would have an overall long-term beneficial effect on hazardous materials. Implementation of the 1999 BARWRP and the CCSF's RWMP would be unlikely to have adverse hazardous materials impacts, as chemicals and hazardous materials associated with recycled water facilities would be stored, used, transported, and disposed of in accordance with applicable regulatory requirements. The Trust's Environmental Remediation program, restoration of Tennessee Hollow, and construction of the LDAC would have a long-term, beneficial effect through the removal of lead-based paint, asbestos, and remediation of impacted soil and groundwater in the Presidio.

3.11.7 CONSTRUCTION TRAFFIC

Implementation of one of the two action alternatives would result in approximately 20 daily construction worker trips for a 12-month period (per each project phase). In addition, temporary lane closures would be necessary when pipeline construction occurs within an existing roadway or trail. Pipeline construction would proceed at roughly 150 to 200 feet per day, and the closures would be small-scale and temporary as described in Section 3.7. Within the cumulative context, the area surrounding the alternative treatment plants and subsurface storage sites (all within the Letterman Complex) would be subject to a variety of simultaneous construction activities, and has the greatest potential for cumulative construction traffic effects. Under both of the action alternatives, most construction activity in this area would occur during Phase 1, which is proposed for implementation during 2002-2003. During Phase 2 of the project, there would minimal project-generated construction in the vicinity of the Letterman Complex, as the majority of construction would be dispersed throughout other areas of the Presidio, as the recycled water distribution system is expanded.

Within the Phase 1 timeframe, the construction of the LDAC project (ongoing), as well as various environmental remediation projects, would occur. The shared use of roadways and demands for staging areas within the Letterman Complex would have a cumulative effect on the traffic conditions. It should be noted that construction activities associated with Doyle Drive would not occur within the Phase 1 timeline.

Construction vehicles would generally access the Letterman Complex via the Gorgas Gate and Doyle Drive/Richardson Avenue. From points east of the Presidio, construction traffic would use Lombard Street through the Lombard Street Gate to the Letterman Complex. Construction traffic would access the Letterman Complex from southbound U.S. 101 via Richardson Avenue and the

Gorgas Gate. Construction traffic leaving the complex would use Halleck, Marshall and Mason Streets to access northbound Doyle Drive at the intersection of Mason Street/Marina Boulevard and Doyle Drive; this traffic would not travel east on Marina Boulevard due to City restrictions.

The additional construction-related traffic from the proposed project and the LDAC project could result in some conflicts with local and regional traffic, especially from the larger construction vehicles. However, because the vehicle trips traveling to and from the complex would be dispersed through the Bay Area, the construction-related vehicle trips generated by both the proposed project and the LDAC project on other regional roadways would not be substantial, and would fall within the normal fluctuations of traffic volumes. Within the Presidio, each project would have their own separate staging areas within, or immediately adjacent to their construction sites. The staging areas for the proposed project would be situated away from, and west of the LDAC project site. The project's staging areas would generally be bounded by Gorgas Road to the north, Edie Road to the south, Kendall Road to the east, and the Thoreau Center parking lot to the west. Traffic leaving the site to go southbound on U.S. 101 would use Lombard Gate as City restrictions prohibit truck traffic from leaving the Gorgas Gate. Note that if the Letterman Redevelopment-Richardson Avenue Access Project is completed prior to completion of this project, trucks would be able to use Gorgas Avenue to access Richardson Avenue (U.S. 101) directly without violating City restrictions. Similarly, trucks traveling to the site from U.S. 101 could use the slip ramp to access the site rather than the Lombard Gate. Construction management plans would be implemented for both projects, and would be developed to provide specific truck routes and other mitigation measures, and to ensure that activities are coordinated.

3.11.8 AIR QUALITY

Construction of either of the action alternatives evaluated in this EA would have minor, temporary effects on air quality. Other past, present or reasonably foreseeable construction activities within the Air Basin could contribute cumulatively to dust and other emissions. The Bay Area Air Quality Management District (BAAQMD) requires implementation of various control actions to minimize these effects, and the project's contribution to Basin-wide construction emissions would be very small. Operationally, emissions associated with the proposed water recycling plant would be minor. The potential for odors would be slight, and would be effectively contained within the proposed treatment facility. No regional or other operational sources of emissions would result from the project alternatives, and thus the project would have a negligible contribution to cumulative air quality conditions within the Basin. Please refer to Section 3.8 for additional discussion on regional air quality attainment plans, and the project's consistency with relevant plans.

3.11.9 NOISE

Operational noise generated by project would fall within the existing ambient noise levels, and no noticeable increase would occur as a result of either action alternative. Under cumulative conditions, Doyle Drive would be either seismically retrofitted within its current alignment or be reconstructed with one of four alternatives currently under consideration. Some of the proposed

alternatives would locate Doyle Drive within a tunnel in the project area, which could have a cumulatively beneficial long-term noise impact on the project area.

Cumulative construction noise would result from the LDAC project and the Doyle Drive construction, which will not occur simultaneously. While these projects would add cumulatively to the ambient noise levels during the construction period, all equipment would need to be operated subject to the limitations of the San Francisco Noise Ordinance. Additionally, the construction period of the proposed project at any particular location would be relatively short-term, and would not be considered to result in a cumulative noise impact.

3.11.10 GEOLOGY & SOILS

Neither the proposed action nor the cumulative projects would increase the likelihood or intensity of seismic activity at the Presidio, or the risk of other geologic hazards such as settlement or landsliding. Most seismic and geologic hazards are unpredictable and unavoidable, and would continue to affect visitors and residents at the Presidio regardless of the proposed development actions. However, development actions at the Presidio, including the proposed action and the cumulative projects, will eventually lead to a greater number of people visiting the area and, therefore, in the event of an earthquake, more people could be exposed to injury and property could be damaged. In addition, short-term construction impacts, especially those related to soil erosion and topsoil loss, could occur with additional development projects.

The potential cumulative risk of additional exposure to seismic and geologic hazards as the Presidio's visitor and resident population increases is not considered significant. As future development projects are designed and constructed, they will incorporate modern earthquake design criteria that are intended to reduce the effects of ground shaking and associated potential for injury, damage, and loss of life. As research into earthquake ground shaking affects advances and more reliable design methods to reduce structural damage are developed, future construction will provide offices and homes that can better withstand earthquake ground shaking. Cumulative soil erosion impacts will be offset by required compliance with BMPs and project Standard Conditions.

CHAPTER 4
REPORT PREPARATION

4.1 SCOPING

Input on the scope and contents of this EA was solicited from numerous federal, state, and local agencies. A list of the agencies is provided below.

- U. S. Environmental Protection Agency, San Francisco, CA
- City and County of San Francisco, Department of Public Works
- City and County of San Francisco, Environmental Review Officer
- City and County of San Francisco, Water Resources and Planning Manager
- City and County of San Francisco, Recreation & Park Department
- San Francisco County Transportation Authority
- San Francisco County Transportation Authority, Doyle Drive Environmental & Design Study
- Caltrans District 4, Program & Project Management
- Regional Water Quality Control Board, San Francisco Bay Region
- California Department of Health Services
- National Park Service, Golden Gate National Recreation Area
- State Clearinghouse, Governor's Office of Planning and Research
- Golden Gate and San Francisco National Cemetery

In addition, the State Clearinghouse notified the following agencies:

- California Resources Agency:
  - Department of Conservation
  - Department of Fish and Game
  - State Historic Preservation Office
  - Department of Parks and Recreation
  - San Francisco Bay Conservation and Development Commission
- California Highway Patrol
- Caltrans
- Department of Health Services
- California Environmental Protection Agency:
  - SWRCB: Clean Water Program
  - RWQCB, Region 2
  - DTSC
- Independent State Commissions:
  - Native American Heritage Commission
  - State Lands Commission

General public input was solicited through the park's official newsletter (the Presidio POST). An article describing the proposed project and requesting input on the scope of the EA ran in the September 2001 issue. The POST mailing list is roughly 9,000 individuals, groups and organizations (including natural and cultural preservation groups) interested in the Presidio.

4.1.1 SUMMARY OF SCOPING COMMENTS

Prior to preparation of the EA, through direct mailing and follow-up presentations, the Presidio Trust solicited the input of public agencies as to their views on any environmental impact in connection with the project. Of the more than 20 agencies invited to comment, four agencies responded. The following is a summary of the issues raised, and how they were addressed in the EA.

U.S. DEPARTMENT OF INTERIOR, NATIONAL PARK SERVICE

The National Park Service (NPS) submitted a scoping comment letter that was generally supportive of the project, noting that it complies with the objectives of the 1994 Presidio General Plan Amendment (GMPA), and recommended the following issues be addressed in the EA.

Range of Alternatives

The NPS asked that potential overlaps/conflicts with the Doyle Drive project be addressed; a discussion of the relationship of the two projects and potential conflicts is provided in Section 3.11 of the EA (Cumulative Impacts, see Land Use discussion). The NPS requested information related to the rehabilitation of the abandoned reservoir be provided; this information is presented in Chapter 2 of the EA. The NPS also suggested that an alternative relying solely on conservation be developed; aggressive water conservation will be practiced by the Trust regardless of the proposed project, and as such is included as a component of all alternatives evaluated in this EA. Chapter 2 was expanded to include a description of these practices. The No Action Alternative, which includes aggressive conservation without construction of a water recycling system, represents the alternative recommended by the NPS.

Scope of EA

Section 106 Compliance. The NPS scoping letter indicated full Section 106 consultation would be needed. Trust staff met with Ric Borjes, Chief of Cultural Resources and Museum Management, GGNRA, early in the process to review the project and discuss the appropriate level of Section 106 compliance. Based on review of the preferred alternative, and efforts to refine the project to avoid adverse impact on cultural resources, Mr. Borjes indicated that full consultation does not appear to be necessary for the project. Subsequent to the scoping process, the Trust, NPS, SHPO, and ACHP executed a Programmatic Agreement regarding 106 compliance within Area B of the Presidio. The process outlined in the Programmatic Agreement will be used to evaluate the project.

Biology & Water Quality. The NPS requested that a variety of environmental issues related to the use of recycled water including biological, water quality and groundwater effects be addressed. The scope of Sections 3.3, Water Resources, and 3.4, Biological Resources were refined to address these issues.

Future Land Uses/Public Safety. The NPS requested that the EA address any future restrictions on land uses or public safety concerns including wading areas used by the public. Under both action alternatives, product water would meet or exceed the highest level of Title 22 standards for recycled water. Permitted uses for this type of water include unrestricted body contact, use on school playgrounds and parks, and for irrigation of food crops. Use of this water at the Presidio for landscape irrigation would in no way restrict or otherwise alter current recreational or other public uses at the park.

Energy Consumption. The NPS requested that energy consumption be addressed in the EA; Chapter 2 includes a discussion of projected energy demands, by alternative.

Seismicity. The NPS requested that information relevant to seismic hazardous be incorporated into the EA; Section 3.10 of the EA addresses these issues.

Discourage Conservation. The NPS asked that the EA address whether the project would discourage conservation by making recycled water available. Water conservation efforts are *demand* management measures that would further reduce the Presidio's water use, and as described above are common to all alternatives evaluated in this EA including the No Action. Water recycling, on the other hand, is the beneficial reuse of wastewater to provide supplemental *supply*. Both are critical components in the Trust's long-term resource planning responsibilities to ensure adequate water supplies to meet the needs of both existing users and future demand for water in a sustainable manner. Due to the Trust's commitment to the conservation and efficient use of its limited water supplies, it is difficult to think of a situation whereby the project would discourage conservation as suggested. In fact, the Trust's permitting requirements for irrigation efficiency for recycled water users would actually result in further water use savings.

Crissy Water Needs. The NPS requested that the declining demand for irrigation following establishment of the grass at Crissy Field be considered. Water demands for established turf areas were used to project recycled water use needs. The Trust is aware that the currently high Crissy Field water consumption would not continue over the long-term.

Construction Impacts. The NPS requested that potential effects on vegetation and wildlife resulting from pipeline construction be addressed, and that the project should seek to avoid effects. The EA evaluates construction-related impacts, and the Trust concurs that best way to minimize environmental impact is through avoidance. Resource protection and avoidance was at the forefront of the development and subsequent refinement of both of action alternatives evaluated in this EA; this is discussed in detail in Section 3.4.

City Limits on Wastewater Flows. The NPS suggested that the Trust assess the effects of a hypothetical scenario in which the City limits its acceptance of wastewater from the Presidio in the future. The Trust has not been informed by the City of any action or potential action to limit future wastewater discharge to the City's combined sewer system. Several City departments and the San Francisco Public Utilities Commission were consulted during the scoping for this project, and this issue was never raised in their responses. Implementation of the proposed project is expected to substantially reduce the amount of annual wastewater flows conveyed to the City's combined sewer system. Under these circumstances, analyzing a speculative future limit on discharge seems unwarranted.

The comment also raises the question of "oversupply" and subsequent disposal of recycled water at the Presidio. The apparent context for such a scenario is during wet-weather periods. The City has expressed concern regarding combined sewer overflows (CSOs), which occur during wet-weather events. The Trust has and continues to take actions to reduce the amount of wet-weather flows contributed by the Presidio. Among the actions already being implemented are the ongoing rehabilitation and repair of existing infrastructure. These repairs have substantially reduced the amount of infiltration of rain (and ground) water into the sewer system. In addition, the EA evaluates additional opportunities to further reduce wet-weather flows through project operations. These opportunities would not, however, include "disposal" of recycled water on-site. Early in the planning process, the concept of routing recycled water to the Bay during wet weather (when irrigation demand is negligible) was discussed. This concept was initially considered based on its ability to reduce wet-weather flows to the City's combined sewer system, possibly to increase water available for natural habitat restoration, and the potential to improve overall quality of the water being discharged to the Bay (recycled water produced at the proposed plant would meet or exceed the highest Title 22 standards). However, the park's wastewater flows represent a fraction of a percent of the total wet weather flows), and this fact, combined with the National Park Service's opposition to this approach, and availability of other measures to minimize wet weather flows from the park, resulted in its removal from further consideration at this time.

SAN FRANCISCO PUBLIC UTILITIES COMMISSION

The SFPUC submitted a scoping letter which addresses the following issues.

Recycled Water Demands

The SFPUC raised several questions related to recycled water demands and the proposed capacity of the water recycling plant; each of these issues have been addressed Chapter 2 of the EA.

Recycled Water Use

Proposed recycled water use areas are described in Section 2.2.1. With regard to the question related to the possibility of using recycled water to maintain Lobos Creek flows, the following information is provided. Since Lobos Creek serves as the primary potable water source for the Presidio, use of recycled water within the creek channel and within the larger watershed is

Presidio, use of recycled water within the creek channel and within the larger watershed is specifically prohibited in the Trust's permit from the California Department of Health Services to operate the existing water treatment plant. Potential impacts to groundwater quality are discussed in Section 3.3, Water Resources. It should be noted that groundwater at the Presidio is not used as a source of domestic supply.

Recycled Water Operation

The SPFUC requested clarification on the wet weather operations of the proposed plant, treatment of sludge and other byproducts, contingency plan to meet water needs when plant is down and facility sizing, location of the proposed facilities, and an inquiry regarding consideration of smaller "package" treatment plants throughout the park. Each of these issues are addressed in Chapter 2 (see Sections 2.2 and 2.4).

SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION (BCDC)

The BCDC indicated that the proposed project did not appear to raise any concerns. The agency also stated that as long proposed construction activities do not block public access to the Bay, there appear to be no issues for the BCDC.

NATIVE AMERICAN HERITAGE COMMISSION

The Native American Heritage Commission submitted a scoping letter recommending a records search and process for documenting the effects of the proposed action. A Sacred Lands File search was previously conducted for the entire Presidio, and this information, along with the results of ongoing research and monitoring conducted by Trust cultural and historic resource staff, are maintained in a GIS database for the park. This database was used in the preparation of the analysis. With regard to the format of the proposed report, the analysis is being conducted in accordance with the requirements of the National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA), consistent with the existing Programmatic Agreement for implementation of the NHPA. Although the format differs slightly than a typical California Environmental Quality Act (CEQA) document, the basic components including existing conditions, impacts and mitigation (with future monitoring requirements) are addressed.

4.2 REPORT AUTHORS

This report was prepared by Environmental Science Associates (ESA) and Presidio Trust Staff.

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In addition, technical assistance was provided by Craig Lichty and Patrick Johnston of Kennedy Jenks Consultants.

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APPENDIX A
POTENTIAL OCCURRENCE OF SPECIAL STATUS SPECIES IN PROJECT STUDY AREA ON THE PRESIDIO

Common Name *Scientific Name*	Listing Status USFWS/CDFG/CNPS	Habitat Requirements	Potential Species Occurrence In Project Study Area
FEDERAL AND STATE LISTED SPECIES			
ANIMALS			
Invertebrates			
Mission blue butterfly *Icaricia icarioides missionensis*	FE/--	Grasslands and coastal scrub with larval food plants (*Lupinus albifrons*, *L. variicolor* and *L. formosus*)	Primarily known from San Mateo County, but occurs at Twin Peaks in San Francisco, and at the north end of Golden Gate Bridge in Marin County. Not detected in past 1994 surveys (Jones and Stokes 1997).
Fish			
Steelhead, Central California Coast ESU *Oncorhynchus mykiss*	FT/--	Drainages of San Francisco and San Pablo bays, central Calif. Coastal rivers	Migrating individuals may occasionally move through bay waters in the vicinity of the Presidio.
Central Valley chinook salmon-spring-run & Proposed Critical Habitat *Oncorhynchus tshawytscha*	FT/CT	Central and northern California coastal rivers and streams	The Presidio outside of the designated ESU range, but migrating individuals may occasionally move through Bay waters in the vicinity of the Presidio.
Chinook Salmon, Winter-run & Critical habitat *Oncorhynchus tshawytscha*	FE/CE	Bay waters	Presidio outside of designated ESU range, but migrating individuals may occasionally move through bay waters in the vicinity of the Presidio.
Central Valley Chinook Salmon, fall/late fall run *Oncorhynchus tshawytscha*	FC/CSC	Spawns in the Sacramento and San Joaquin Rivers and their tributaries	Presidio outside of designated ESU range, but migrating individuals may occasionally move through Bay waters in the vicinity of the Presidio.
Amphibians			
California tiger salamander *Ambystoma californiense*	FC/CSC	Wintering sites occur in grasslands occupied by burrowing mammals; breed in ponds and vernal pools	Species has not been identified from the project area. No known occurrences in Presidio (Goals Project 2000).
California red-legged frog *Rana aurora draytonii*	FT/CSC	Breed in stock ponds, pools, and slow-moving streams	Historically known to occur at Mountain Lake (CDFG 2001); Not detected during 1994 surveys (Jones and Stokes 1997).
Birds			
Marbled murrelet *Brachyramphus marmoratus*	FT/CE	Nests in dense, old growth forests along coast	Uncommon winter transient (Jones and Stokes 1997).
Western snowy plover (nesting colony) *Charadrius alexandrinus nivosus*	FT/CSC	Sandy beaches on marine and estuarine shores - requires sandy, gravely, or friable soils for nesting	Uncommon winter visitor to coastal sandy areas (Jones and Stokes 1997).

APPENDIX A (Cont.)
POTENTIAL OCCURRENCE OF SPECIAL STATUS SPECIES IN PROJECT STUDY AREA ON THE PRESIDIO

Common Name *Scientific Name*	Listing Status USFWS/CDFG/CNPS	Habitat Requirements	Potential Species Occurrence In Project Study Area
Little willow flycatcher *Empidonax traillii brewsteri*	FSC/CE	Nests and forages in dense riparian cover	No suitable habitat. Willow riparian not extensive enough.
Willow flycatcher *Empidonax traillii extimus* (nesting)	--/CE	Large willow riparian forest along rivers and streams	Uncommon spring and fall migrant at Lobos Creek and Mountain Lake (Jones and Stokes 1997).
American peregrine falcon *Falco peregrinus anatum*	FD/CE	Nests in cliffs and outcrops usually adjacent to lakes	Uncommon nonbreeding resident in Presidio; forages throughout Presidio.
California black rail *Laterallus jamaicensis coturniculus*	FSC/CT	Nests and forages in tidal emergent wetland with pickleweed	No suitable habitat present.
Brown pelican *Pelecanus occidentalis californicus* (nesting colony)	FE/CE	Forages in open water – roosting in flatlands such as berms and islands	Regular visitor in shore areas of Presidio, especially on ocean side. Do not breed in S.F. Bay (Goals Project 2000).
California least tern *Sterna antillarum browni* (nesting colony)	FE/CE	Nests along the coast from San Francisco Bay south to northern Baja California - colonial breeder on bare or sparsely vegetated flat substrates including sand beaches, alkali flats, land fills, or paved areas	Rare nonbreeding fall transient. Nests across the bay at the Alameda Naval Air Station. Species not known to breed on the S.F Peninsula (Goals Project 2000).
California clapper rail *Rallus longirostris obsoletus*	FE/CE	Nests and forages in emergent wetland with pickleweed, cordgrass, and bulrush	No suitable habitat present.
Mammals			
Steller (northern) sea lion *Eumetopias jubatus*	FT/--	Pacific Coast south to Santa Rosa Island, CA.	Migrating individuals may occasionally move through Pacific Ocean outside of the Presidio. Unlikely to be found at any time of year in the Presidio.
PLANTS			
Presidio manzanita *Arctostaphylos hookeri* ssp. *ravenii*	FE/CE/1B	Chaparral, coastal prairie and coastal scrub; rocky serpentine slopes	Former San Francisco area endemic; limited in wild to one plant and clones on serpentine bluff above Baker's beach.
Presidio clarkia *Clarkia franciscana*	FE/CE/1B	Serpentine outcrops in coastal scrub, serpentine chaparral or grassland	Known to occur on serpentine soils in the Presidio. Not detected in Presidio during past Presidio surveys (NPS 1999c).
Marin dwarf flax *Hesperolinon congestum*	FT/CT/1B	Chaparral and valley/foothill grassland; serpentinite soils	Known to occur in dry, serpentine scrub and grassland slopes in the Presidio (NPS 1999c).

APPENDIX A (Cont.)
POTENTIAL OCCURRENCE OF SPECIAL STATUS SPECIES IN PROJECT STUDY AREA ON THE PRESIDIO

Common Name *Scientific Name*	Listing Status USFWS/CDFG/CNPS	Habitat Requirements	Potential Species Occurrence In Project Study Area
San Francisco lessingia *Lessingia germanorum*	FE/CE/1B	Open sandy soils of remnant dunes in coastal scrub	Known to occur on open sandy soils and is only known from San Francisco and San Mateo counties (NPS 1999c). Population introduced by NPS is roughly 300 feet from the project work area.
California seablite *Suaeda californica*	FE/--/1B	Margins of coastal saltmarshes.	Recently reintroduced to Crissy Field marsh by NPS; population introduced by NPS is roughly 300 feet from the project work area.

FEDERAL OR STATE SPECIES OF SPECIAL CONCERN

ANIMALS			
Invertebrates			
Globose dune beetle *Coelus globulus*	FSC/--	Northern foredune, coastal dune scrub with herbaceous plants in sandy soils	Potential habitat at Crissy field in Presidio. Not detected in 1994 surveys (Jones and Stokes 1997).
Tree lupine moth *Grapholita edwardsiana*	FSC/--	Coastal sand dunes typically associated with its larval host plant Lupinus arboreus (yellow bush lupine)	Common throughout Presidio where host plant available; observed during 1994 surveys (Jones and Stokes 1997). Host plant observed in Presidio.
San Francisco fork-tailed damselfly *Ischnura gemina*	FSC/--	Wetlands with emergent vegetation	Potential habitat at Mountain Lake and Lobos Creek in Presidio outside Presidio. Observed near Fort Point.
Bumblebee scarab *Lichnanthe ursina*	FSC/--	Open coastal sand dunes	Not detected during 1994 survey, most specimens collected in San Francisco early this century (Jones and Stokes 1997).
Amphibians			
Foothill yellow-legged frog *Rana boylii*	FSC/CSC	Fast-moving streams and rivers in chaparral, forests, and woodlands	Not detected during 1994 amphibian surveys (Jones and Stokes 1997). No suitable habitat.
Reptiles			
Silvery legless lizard *Anniella pulchra pulchra*	FSC/CSC	Areas with sandy or loose loamy soils under open vegetation near beaches, chaparral, or pine-oak woodland	Extirpated form Presidio (Jones and Stokes 1997). Presidio does not provide suitable habitat for this species.
Western pond turtle *Clemmys marmorata*	FSC/CSC	Lakes, ponds, reservoirs, and slow-moving streams and rivers, primarily in foothills and lowlands	Historical occurrences at Mountain Lake but not detected during 1994 surveys (Jones and Stokes 1997). No upland habitat suitable for this species occurs on the Presidio project area.

APPENDIX A (Cont.)
POTENTIAL OCCURRENCE OF SPECIAL STATUS SPECIES IN PROJECT STUDY AREA ON THE PRESIDIO

Common Name *Scientific Name*	Listing Status USFWS/CDFG/CNPS	Habitat Requirements	Potential Species Occurrence In Project Study Area
California horned lizard *Phrynosoma coronatum frontale*	FSC/CSC	Sandy open areas in riparian woodland, grassland, coastal scrub, mixed chaparral, and oak woodland	No known occurrences on Presidio and not identified in recent focused surveys (Jones and Stokes 1997).
Birds			
Tricolored blackbird *Agelaius tricolor*	FSC/CSC	Nests in freshwater marshes with dense stands of cattails or bulrushes, occasionally in willows, thistles, mustard, blackberry brambles, and dense shrubs and grains	Suitable habitat too fragmented. Not detected during past Presidio surveys (Jones and Stokes 1996; Jones and Stokes 1997).
Ferruginous hawk *Buteo regalis*	FSC/CSC	Forages in grassland, agricultural lands, and pastures (wintering only)	Uncommon seasonal migrant.
California yellow warbler *Dendroica petechia brewsteri*	--/CSC	Nests in riparian areas dominated by willows, cottonwoods, sycamores, alders, or mature chaparral; may use urban areas near waterways	Uncommon seasonal migrant; not known to breed at Presidio (Jones and Stokes 1997). Slight possibility of occurrence in arroyo willow areas in Presidio. Low nesting potential.
Red-tailed hawk *Buteo jamaicensis*	--/--	Open stands of deciduous and coniferous forests; frequents croplands and pastures	Observed; potentially nests in Historic Forest.
Red-shouldered hawk *Buteo lineatus*	--/--	Dense riparian woodland, hardwood-conifer habitats adjacent to swamps, marshes, and wet meadows	Observed; potentially nests in Historic Forest.
Vaux's swift *Chaetura vauxi*	--/CSC	Nests in hollow, burned-out tree trunks in large conifers	Uncommon seasonal migrant
Saltmarsh common yellowthroat *Geothlypis trichas sinuosa*	FSC/CSC	Nests in fresh and saltwater marshes, needs thick continuous cover down to water surface for foraging	Uncommon resident and possible breeder at Mountain Lake (Jones and Stokes 1997) outside of Presidio.
Mammals			
Pallid bat *Antrozous pallidus*	--/CSC	Day roosts are mainly in caves, crevices and mines; also found in buildings and under bark. Forages in open lowland areas	Suitable roosting sites are absent at the Presidio; thus species occurrence is unlikely (Jones and Stokes 1997).
Greater western mastiff bat *Eumops perotis californicus*	FSC/CSC	Needs rock crevices, grassland, coastal scrub; may use urban areas	Suitable roosting sites are absent at the Presidio; thus species occurrence is unlikely (Jones and Stokes 1997).
Small-footed myotis *Myotis ciliolabrum*	FSC/--	Roosts in caves, buildings, mines and crevices, sometimes bridges and bark	The Presidio is located well north of the geographical range for this species.

APPENDIX A (Cont.)
POTENTIAL OCCURRENCE OF SPECIAL STATUS SPECIES IN PROJECT STUDY AREA ON THE PRESIDIO

Common Name *Scientific Name*	Listing Status USFWS/CDFG/CNPS	Habitat Requirements	Potential Species Occurrence In Project Study Area
Long-eared myotis *Myotis evotis*	FSC/--	Roosts in buildings, crevices, under bark, snags, and in forests. Caves are the primary night roost	Suitable roosting sites are absent at the Presidio; thus species occurrence is unlikely (Jones and Stokes 1997).
Fringed myotis *Myotis thysan sodes*	FSC/--	Roosts in caves, old buildings and under bark	Suitable roosting sites are absent at the Presidio; thus species occurrence is unlikely (Jones and Stokes 1997).
Long-legged myotis *Myotis volans*	FSC/--	Roosts in rock crevices, buildings, tree bark, snags, mines and caves. Trees are perhaps the most important daytime roosts for this species.	Suitable roosting sites are absent at the Presidio; thus species occurrence is unlikely (Jones and Stokes 1997).
Yuma myotis *Myotis yumanensis*	FSC/CSC	Roosts in caves, old buildings and under bark. Forms maternity colony in the spring.	Observed, though uncommonly, during past survey. Suitable roosting sites are absent at the Presidio; thus other than incidental species occurrence is unlikely (Jones and Stokes 1997).
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	FSC/CSC	Forests with moderate canopy cover and brushy understory	Not detected during past Presidio surveys (Jones and Stokes 1997).
Townsend's big-eared bat *Plecotus townsendii*	FSC/CSC	Roosts in caves, mines, buildings or other human-made structures for roosting. Forages in open lowland areas	Suitable roosting sites are absent at the Presidio; thus species occurrence is unlikely (Jones and Stokes 1997).
Salt marsh vagrant shrew *Sorex vagrans halicoetes*	FSC/CSC	Inhabits tidal salt marshes dense with pickleweed around south San Francisco Bay	Collected in 1940 probably located between Fort Point and Crissy Field (Jones and Stokes 1997). No suitable habitat in Presidio.
PLANTS			
Franciscan manzanita *Arctostaphylos hookeri* ssp. *franciscana*	FSC/--/1A	Serpentine outcrops in chaparral and serpentinite coastal scrub.	Former San Francisco area endemic; limited currently to cultivation. Not detected in Presidio during past Presidio surveys (NPS 1999c).
San Francisco spineflower *Chorizanthe cuspidata* var. *cuspidata*	FSC/--/1B	Sandy terraces and slopes of coastal bluff scrub, coastal dunes, coastal prairie and coastal scrub	A small area of marginal coastal scrub habitat is found in the Presidio. All Presidio records are from the southern portion of the park. Occurs on Lobos Creek dunes.
San Francisco wallflower *Erysimum franciscanum*	FSC/--/4	Northern foredune, northern coastal scrub, northern coastal bluff scrub, central dune scrub	Occurs on coastal bluffs (NPS 1999c).
San Francisco gumplant *Grindelia hirsutula* var. *maritima*	FSC/--/1B	Coastal bluff scrub, coastal scrub, valley and foothill grassland; slopes with sandy or serpentinite soils	Occurs on coastal bluffs (NPS 1999c).

APPENDIX A (Cont.)
POTENTIAL OCCURRENCE OF SPECIAL STATUS SPECIES IN PROJECT STUDY AREA ON THE PRESIDIO

Common Name *Scientific Name*	Listing Status USFWS/CDFG/CNPS	Habitat Requirements	Potential Species Occurrence In Project Study Area
San Francisco campion Silene verecunda ssp. verecunda	FSC/--/1B	Coastal habitats (scrub, prairie, bluff scrub), grassland and chaparral; sandy to mudstone or shale soils	Occurs in coastal dune scrub. Suitable habitat at Crissy field in Presidio.
San Francisco owl's clover *Triphysaria floribunda*	FSC/--/1B	Coastal prairie and scrub, valley and foothill grassland; often on serpentinite soils	Found in Fort Scott area in 2001 (Chasse, 2001).

SPECIES ON OTHER LISTS

ANIMALS			
Monarch butterfly *Danaus plexippus* (winter sites)	--/*	Eucalyptus groves (winter sites)	Eucalyptus groves north of Kobbe Drive.
Mydas fly *Mydas clavatus*	Considered locally rare by GGNRA	Sand dunes	Known to occur above Baker Beach and near the east end of Lobos Creek (Jones and Stokes 1997). Habitat occurs outside the project study area.
PLANTS			
Coast rock cress *Arabis blepharophylla*	FC3c/--/4	Broadleafed upland forests, coastal prairie, coastal scrub; often in rocky places	Observed during 2000 past surveys in Presidio on coastal bluffs (NPS 1999c).
Franciscan thistle *Cirsium andrewsii*	--/--/1B	Coastal bluff scrub, serpentine habitats in moist sites	Observed in Presidio in 1999 on coastal bluffs (NPS 1999c).
Dune gilia *Gilia capitata* ssp. *chamissonis*	--/--/1B	Coastal sand dunes and openings of coastal dune scrub	No documented occurrence Presidio (Jones and Stokes 1997, NPS 1999c). Suitable habitat potentially at Crissy Field.

Status codes:

Federal Categories (U.S. Fish and Wildlife Service)

FE = Listed as Endangered by the Federal Government
FT = Listed as Threatened by the Federal Government
FSC = Federal Species of Concern
FC3c = Too widespread and/or not threatened
FD = Delisted. Status monitored for five years.

State Categories (California Department of Fish and Game)

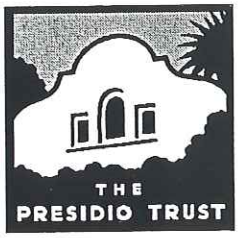
CE = Listed as Endangered by the State of California
CT = Listed as Threatened by the State of California
CR = Listed as Rare by the State of California
CSC = California Species of Special Concern
* = California Natural Diversity Data Base Special Animals List

California Native Plant Society (CNPS)

List 1A = Plants presumed extinct in California
List 1B = Plants rare, threatened, or endangered in California and elsewhere
List 2 = Plants rare, threatened, or endangered in California but more common
List 3 = Plants about which more information is needed
List 4 = Plants of limited distribution

-- No listing status

SOURCES: CDFG 2001; CNPS 1999; NPS 1999, 2000; Jones and Stokes Associates 1997; Munz and Keck 1970; Goals Project 2000.



The Presidio Trust is a federal government corporation established by Congress in 1996 through enactment of the Presidio Trust Act (Public Law 104-333). The Presidio Trust's mission is to preserve and enhance the Presidio as part of the national park system and achieve financial self-sufficiency by fiscal year 2013. The Presidio Trust is governed by a seven-member Board of Directors comprised of the Secretary of the Interior or the Secretary's designee, and six members appointed by the President of the United States. The Presidio Trust is guided by the Presidio Trust Act to operate in accordance with the purposes set forth in Section One of the Act that established the Golden Gate National Recreation Area (P.L. 92-589) and the general objectives of the 1994 General Management Plan Amendment for the Presidio. The Presidio Trust's area of responsibility, defined in Title I of the Trust Act as Area B, includes nearly all built areas of the park. The entire Presidio is a part of the Golden Gate National Recreation Area.